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JUNE
1922

VETERINARY MEDICINE

4753 GRAND BOULEVARD
Chicago

The Proportion of Eosinophiles in the Blood of Cattle
A New Operation for Umbilical Hernia
Effects of Vitamine Deficiency on Various Animals
Immunization of Cattle Against Abortion Disease
Successful Operation for Traumatic Pericarditis
Immunize the Spring Pigs
Cocklebur Poisoning in Swine
The Eggs and Larvae of Swine Parasites
Posology of Carbon-Tetrachlorid
The Treatment of Mastitis and More Than Fifty Other Articles

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VOL. XVII **No. 6**

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Veterinary Medicine

Vol. XVII JUNE, 1922 Number 6

Editorial

FOUNDER OF VETERINARY EDUCATION IN AUSTRIA

It has often happened in the history of the world that the man who preconises a thought is later entirely screen into obscurity by the achievements of those who exploit it. This is particularly the case in veterinary history. We have too often praised the man of material achievement and have left unsung the name of he who has made the achievement possible. It is with this idea in mind that we introduce another pioneer of veterinary education to our readers, who will recall Bourgelat (January, 1922) who founded veterinary education, and Vial (February, 1922) who carried the first message into England. We now retrace our steps into the interior of Continental Europe where the seeds of Teutonic veterinary education were implanted and which developed into the great schools of the Central Empire. As fast as authentic biographic sketches can be obtained the thread will be carried through the years into the present day events.

John Gottleib Wolstein
1738-1820

Born March 14, 1738, in Finsberg in Silesia; died in Altona July 3, 1820. He studied medicine and surgery in Vienna and practiced surgery there for nine years. On the recommendation of Brambilla, the Imperial Surgeon, as well as by Field Marshall Laszy he was sent to Alfort where he studied under Bourgelat and Chabert. In 1772 and 1773 he was closely associated with Lafosse in Paris which was of a great advantage to him. In 1773 he went to London, Denmark, Mecklenburg and Holland. In 1775 in Jena he received the degree in medicine and surgery. 1777 Vienna already had a veterinary hospital rected by Scotti. Wolstein opened the same as a veterinary school for the purpose of educating there military veterinarians and farriors. In 1795 he was exiled from Austria, probably on account of his free thoughts or possibly also because he was a Protestant and he moved to Altona where he died at the age of 82. Wolstein was the founder of scientific veterinary medicine and published the following works:

Umbilical and Naval Hernias (1784); Diseases of Colts (1787); Injuries of Horses by Weapons (1788); Phlebotomy (1791); Infectious Diseases of Cattle, Sheep, Cattle Plagues (1789); tc. (1791, 1800, 1808); Nound Treatment of Animals (1784); Maintaining of Army Horses in Winter Quarters (1793); Horse Plague (1805); The Development of Glanders (1807) and Breeding of Animals (1814). Finally a revision of the work of Max Fugger on "The Management of Studs" which he published under the title of "The Breeding of Army and Other Horses." Many of the publications of Wolstein were translated into French, Italian, Russian and the Swedish language. His publication on "Conformation, Recognition of Age, Color, etc., of the Horse" has been published on two occasions without his knowledge.

PROPORTION OF EOSINOPHILES IN THE BLOOD OF BOVIDAE

By L. Panisset and G. Havet

Excerpted for Veterinary Medicine by H. Simonnet, Paris

All authors agree that eosinophilia reflects a pathological condition and particularly that an excessive number of acidophiles characterizes the existence of parasites in the individual.

The determination of eosinophilia is not possible unless the average percentage of eosinophiles is known. The hematological researches in this connection (Jolly, Sacquepee, Bezancon, Courmont, Naegeli) for human beings give the average percentage as 2.5% to 3%.

As regards the blood of the different species of domestic animals, Marek in a classical work gives the following percentages of acidophiles: Horses, 2% to 4%; asses, 10%; bovidae, 1% to 2%; swine, 2% to 4% and dogs, 2% to 2.5%.

Aside from the ass whose percentage is very high it will be noticed that the blood of the other species approaches that of man.

However, in seeking to determine the leucocytic formula of bovidae we were struck by the entirely different results from those given by Marek in regards to the proportions of acidophiles.

We have examined a large number of specimens from bovine adults (cows of the breed Breton) and found that in none of these was the percentage less than 5.4% of eosinophiles. The averages we determined were as follows: 5.4%, 6.5%, 6.9%, 8.5%, 9.8%, 9.9%, 10%, 10.5%, 11%, 11.1%, 12.9%, 13%, 13.5%, 14.4%, and 18.6%.

They differ not only with the animals but also with the series of preparations examined for each animal. With blood obtained at the same time, exposed on different plates, an entirely different number of eosinophiles can be found for each hundred leucocytes; for example from 5.4% to 13.5%.

The general percentage, after assembling the results obtained in bovidae, was 11.7%.

The preparations were always fixed with alcohol-ether and stained with the same method (panoptic of Pappenheim).

In view of eliminating the possibility of parasitic infestation the excrements were examined at least of several of the subjects and sero-precipitation tests were made with the liquid of hydatid cysts.

The bovidae examined were in good health and condition and were kept at the laboratory for a long time. Some had never been sick and others had long since recovered from foot and mouth disease. One was in the period of lactation. Two of them affected with chronic enteritis and actinomycosis respectively did not show leucocytic formulae that were much different from those of healthy animals.

Our findings were so discordant with those usually accepted as we increased our examinations that we searched the literature on the subject and found that Dimmock and Thompson (American Veterinary Review, Vol. XXX, No. 5) in examining the normal blood of bovidae arrived at similar results. These authors found the following figures: Average, 13.5%; extremes, 3.89% to 26.5%.

In calves we found the percentage much lower than in adults, noting the following results: 0.8%, 1.02%, 2.5% and 6.5%. It has seemed to us that in these young animals, the percentage is the function of age.

Our results show that in bovidae 10 to 15 eosinophiles or 100 leucocytes does not indicate parasitism or any other conditions capable of producing eosinophilia, because this percentage is normal. But the high proportion is only in adults. In calves it is lower, scarcely exceeding 1% to 2%. (Ext. Comptes Rendus de la Societe Biologie, Feb. 1922.)

PITUITIN IN BOVINE OBSTETRICS

By Prof. G. Moussu, Alfort, France

Pituitin or extract hypophysis is the name given to extract of the pituitary glands. The manufacturers of organotherapeutic products make it from pituitary glands gathered en masse in the large abottoirs. On account of the difference in the various commercial brands the dosage and potency is unforunately still faulty, and make the estimation of results veritably difficult. Comparative dosage can only be given of each particular brand.

It is, however, well known that pituitin acts on the renal function, activating diuresis; and on the gravid uterus, provoking contractions. The experimental researches conducted in human obstetrics show that subcutaneous injections of pituitin render a real service under the restricted condition of not being utilized except in certain determined phases of parturition. As it produces an engergetic and prolonged action on the musculature of the uterus its employment should be exclusively reserved for the "expulsion stage" when the cervix is totally dilated, the fetus normally presented and the expulsive efforts are absent or feeble.

The use of pituitin, on the contrary, is prohibited in all cases where the preparation for normal delivery is not complete and perfect, for the reason that it can cause incidents and even accidents through non-dilation or insufficient dilation of the cervix; through tetanization of the uterus over the fetus; and through causing futile violent contractions and thus complicating labor with very intense labor pains.

It does not appear, a priori at least, that pituitin can render as much service in veterinary as in human obstetrics because the former is more often hindered by parturient straining than by complete absence of contractions. But as pituitin acts on the musculature of the uterus it might be well to inquire whether its subcutaneous administration would not be justified in certain cases of non-delivery in cows.

It is perhaps one way of provoking a prompt involution of a passive inert uterus, wherein as a consequence of adhered fetal membrances, it shows no tendency of doing so.

One condition seems to impose itself: That of withholding the drug as long as the cervix is not completely dilated, until the day of parturition or the two or three days following when there is some assurance as to the state of the uterine orifice. When later than this the orifice is still contracted the contraindication is even more formal because there is then great danger of imprisoning the mass to be expelled in the uterus.

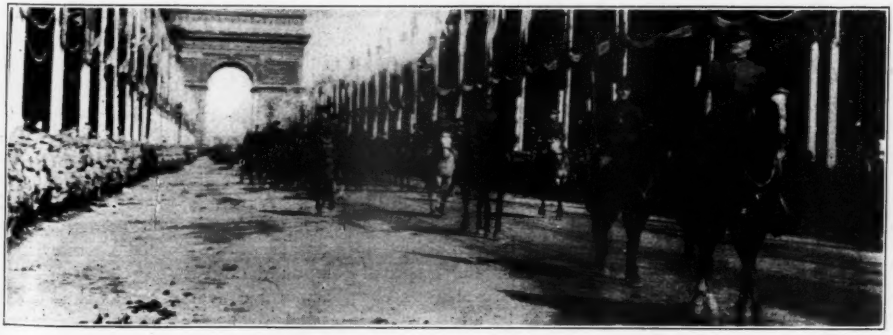
It seems this is a study to be undertaken, pursued and specified. I have had no cases of non-delivery here that would have enabled me to make the test but believe that this could be done in practice.

—Recueil de Medicine Veterinaire.

THE CARDINAL PITFALL OF STERILITY WORK

The cardinal pitfall of sterility work in cows is that of mistaking a pregnant cow for a sterile one. There is the danger also of pronouncing a non-pregnant cow sterile and then live to see her conceive and give birth to a healthy calf. Experts make few of these errors, yet all of them may sometimes make them. If some have thus far succeeded in avoiding these pitfalls they may fall into one in the future.

The man who does not make any mistakes at all is indeed a rare diagnostician no matter in what particular branch of medicine he may be engaged. Medicine is a tricky occupation because of its erratic complexity, of which we are reminded by a letter requesting us to publish under the caption, "Farmer Succeeds where Specialist Fails," the story of a Holstein cow of fabulous value that was pronounced hopelessly sterile only to give birth, first to a slink caused by the diagnostic maneuvers and then ten months later to a normal calf. The diagnostician in this case is given as a demonstrator of methods of treating abortion disease and sterility employed as an official of one of the large commonwealths. The cow is owned, it is said, by one of the largest breeders of Holstein-Friesians in America. The farmer in question is the father of the butcher to whom the cow was sent to be slaughtered, but who advised the owner to wait for his father's opinion before slaughtering her. This was done with the results that the veterinarian, theretofore so certain of his infallibility, brought suspicion not only upon himself and the position he holds, but also upon the whole veterinary profession. The moral is "Watch your step."



OFFICERS' MOUNTS, U. S. ARMY
General Pershing and Staff at the head of his Army at the Fetes de la Victoire on the Champs Elysee, July 14, 1919

Editors' Personal Page

A journal that vacillates with every breeze, shudders at every wind and side-steps every passing storm can't help you much.

Do you get everything out of Veterinary Medicine that goes into it? We would like to feel that you do and that the journal plays a role in your daily life.

A veterinary journal, like a newspaper, can not rise above the level of its patrons. Its standards are set by its readers and its mail is the barometer of its popularity.

We are devoting too much of our energies to the matter of buying supplies and too little to the study of their use.

When time-honored customs so change that the medical profession can prevent the sale of quinine over the counter where malaria exists, the veterinary profession may then hope to control the sale of hog cholera serum in the corn belt.

We believe the only way veterinary practice can continue to live, thrive and hold respect is by retrieving the idea that success is a matter of education and experience and not simply one of purchasing supplies. If our only hope were to be found in keeping drugs out of the hands of laymen, as many are being led to believe, we might just as well sing requiem now and not prolong the agony.

Agents known or reputed to possess great merit in the treatment of man or animals always find their way to the counters where he who has the price may buy. The professional man stakes his destiny and stubbornly pins his faith upon his ability to use them more intelligently than the non-medical person. The time and energy devoted to restricting distribution might better be devoted to the study of scientific and skillful application. At least, we should not be so short-sighted as to let any other impression grow into the mind of the public.

Dorland says it's pronounced vit-am'-in.—S. H.

A subscriber writes: "It seems to me that veterinary practice as a vocation is being allowed to drift from lack of leadership. Or, is it being unconsciously led astray by unsympathetic interests? There seems to be no one on the job defending the practitioner's position."

Already in 1886—thirty-six years ago—Robert Koch, in writing at length on the etiology of tuberculosis, stated that steps taken against the disease must be carefully considered for fear of prejudicing the advantages gained. The advice was so well taken that it has needed no change.

It has been well stated "The state of unrest in the medical profession largely due to public service and the healing cults can be overcome by service." This statement is quite applicable to the veterinary profession.

Veterinarians in large cities, especially New York and Chicago, report business exceptionally good. Those whose practices are confined chiefly to horses are actually amazed at the prosperity they are enjoying.

When the veterinarian treated animals with drugs and prescriptions he compounded himself in his own pharmacy, the mystery surrounding therapeutics was too deep for the layman to fathom, but since all these "ines," "ols" and biologics have crept in and were unwisely accepted as specifics, the outsider has become more and more determined to use them himself to save the expense of the professional fee. A return to the old order is not insisted upon, but it does seem important just now to accept the special chemicals, the special compounds and the special biologics as purely pharmacal conveniences as they always were intended to be accepted, both by the honest manufacturer and the educated practitioner.

General Practice

Edited by W. J. MARTIN, Medicine, and L. A. MERILLAT, Surgery

A New Operation for Hernia, Particularly Umbilical Hernia of All Animals

By J. R. Zecha, D. V. M., Elmwood, Kansas

DEFINITION. An operation for exomphalocele by means of special sutures, designed to replace clamps and ligatures.

The operation is a substitute for clamps and has advantages over all of the other methods for this condition. It has the appearance of a real surgical procedure and always leaves a good impression on the client. Compared with blisters, clamps, caustics, skewers and even ligatures it is more refined. When years ago I practiced as an empiric I found that ranchmen practiced them all. It was nothing novel to find one fired, one blistered, another ligated and still others clamped by the owners. I once found a case the ranchman had treated by transfixing the sac with a finishing nail and then strangulating it with a piece of baling wire. Another case of more than usual interest was that of a calf that a ranchman had ligated in such a manner as to close up the sheath and entirely block the passage of urine. The suture method described below is never imitated by these ambitious men.

It is also superior to the more popular Derr operation because it does not pucker up the skin adjacent to the base of the sac and there are no protruding ends of skewers or clamp to catch on objects while sloughing off.

Indications. It is well known that there is a tendency of all umbilical hernia to recover spontaneously through the natural provisions to close up the navel aperture, yet when the opening is large and there are already intestines in the sac I advise immediate intervention instead of waiting to see what will happen. This course is justified by the fact that prostination makes the operation more difficult and always more dangerous. The fact that it is always good advice to attempt to help nature holds particularly good in the case of umbilical hernias.

Restraint. The kind of restraint that is best, differs somewhat with the size of the animal. A young colt or calf can be held by two assistants or it can be secured with ropes. Larger animals must be cast and properly secured with ropes or harness the same as for castrations. Shoats and other small animals are best secured on the canine operating table or simplar contraption. Local anesthesia is helpful and of course more humane.

Instruments. Scissors, clippers, large curved needle, suturing material, antiseptic solution and two towels. The curved scissors will answer in lieu of clippers and heavy wrapping twine is the best suture. Silk seems to absorb too rapidly.

Type of Erstwhile Incurable Hernia

Technique: 1st step. Mark the field by snipping a pinch of hair at the extreme anterior and at the extreme posterior end of the sac and also at the apex while the patient is still in the standing position. Cast the patient and roll into the dorsal position, clip the hair and disinfect the area and then place the towels on each side of the sac to prevent the needle and suture from becoming soiled while suturing.

2nd Step. The sutures resemble a succession of matress sutures placed in such a manner as

to include all of the tissue along its whole route, and are made without rethreading the needle. Thread the needle and be sure there is enough material to complete the operation. Thread it so that one strand is two inches longer than the other. Reduce the hernia and draw the sac together at the base as much as possible in the longitudinal direction. Start suturing at either end and keep along the line between the marks made while the animal was standing. Pass the needle through from right to left and draw the thread through to a point near to the short end of the suture. Take this short end and tie it as an interrupted suture to the same strand on the other side around the end of the sac. Cut this strand at the knot and thread it to the needle so that its end will be two inches longer than the other strand. This will prevent it from being drawn through in making the next stitch. Draw the sac together at the base again and

"Tying Off" Such a Growth Before Ablation Makes the Operation Bloodless

pass the needle through from left to right until the uncut thread tightens. Pull on the end protruding from the right side to locate the proper strand and tie as a matress suture. Cut the tied end and rethread the needle so as to leave the cut end two inches longer again, and repeat by passing the needle through from right to left. Continue this process until the other end of the sac is reached.

If the hernia is a large one the sutures should not be drawn too tight because they may slough off too soon.

After Care. Little or none is required, but the parts may be examined from time to time for complications. After the sac sloughs off a healing powder is prescribed. When the sac tissues become putrid or fly-blown, preservative agents are applied. For this creolin, formalin and boric acid may be used.

Sequelae. Recurrences are rare although like all similar operations they do occassionally occur. I have had one case of tetanus due purely to improper disinfection in very unsanitary quarters.

Results. I have used this operation to the exclusion of all others in a pretty extensive practice with only one failure requiring a second operation. I have resorted to it in colts, calves, pigs and dogs, with one death in a colt from tetanus and one in a calf from septicemia.

Discussion of the Operation before the Kansas State Veterinary Medical Association

The following questions were asked the author during the discussion of the paper which was given publicity for the first time at the annual meeting of that association, January, 1922:

What would be the result if one of the sutures would break prematurely?

The author's reply: It would prevent the sloughing of the portion involved forming a sort of peduncle that can either be ligated or simply twisted off.

Why not soak the suture material with tincture of iodin and paint the area with it to prevent infection?

The author's reply: Iodin weakens suture material. The idea is to assure a suturing that will hold until sloughing occurs.

What success have you had in umbilical hernia of male shoats?

The author's reply: The operation is not indicated in male pigs or any other males where it would implicate the sheath area. It is likewise contra-indicated in pigs that are too fat around the hernia sac.

Comment: Too much credit can not be given the author for having preconized an entirely unique and very practical method of tying off tissues en masse in certain surgical operations, a feature which to us is a most valuable achievement, not only for handling the redundant skin of certain hernias but also in many other operations. Tumours of the mammae bitches and sows can thus be tied off before cutting off the growth. In the latter group of cases it will only be necessary to draw the loops tight enough to prevent blood vessels from slipping above them when the growth is removed and thus become the cause serious subcutaneous bleeding. This accident can also be averted by cutting off the growth some distance from the suture line.

The author, in-so-far as the operation applies to umbilical hernia, should, however, have

warned against suturing both layers of the sac. Like in all umbilical hernias the inner or peritoneal layer falls into the aperture and being held there by the sutures, adheres and forms the plug or floor that prevents recurrence.

The Effect of Vitamine Deficiency on Various Species of Animals

By L. H. Pammel, Ph. D., Ames, Iowa
Professor of Botany, Iowa State College

VICTOR E. NELSON, Alvin R. Lamb and V. G. Heller have published their results of "The effect of vitamine deficiency on various species of animals."* The authors discuss the importance of vitamine, a requirement of growing pigs and the paralysis of the hind limbs in rabbits when feeding rabbits oats along with similar rations.

"We have observed nutritive failure, generally terminating in a peculiar paralysis of the hind quarters.

"In connection with the question of various symptoms of deficiencies of certain rations, we have observed that it is a very difficult problem at times to ascribe certain specific symptoms of a faulty diet to a particular factor which might be lacking in that diet. We have noticed in many of the rats in our colony various diseased conditions of the skin, in some cases so marked as to cause growths and wart-like malformations on the ears and nose and characteristic concretions upon the tail. In a good many cases these eruptions have been cured by the feeding of butter-fat, in other cases by the addition of casein to the ration, so that it appears that these diseased conditions of the skin may be the outcome of a poor nutritive condition and not due to any specific factor.

"In order to determine whether a deficiency of Vitamine A in the ration of the sow would cause eye-disease in the young pigs we fed a sow throughout the gestation and suckling periods on the following ration:

White corn (6)	55
Linseed oil meal	22
Ground oats	15
Tankage	5
Supplementary salt mixture	3

No green vegetation was obtainable by the sow or pigs. Four pigs were farrowed, three of which lived but remained rather unthrifty and grew slowly both during the suckling period and after; they were fed the same ration as the sow had received. No signs of congestion of the conjunctivae were observed at any time. After several months on this ration an allowance of about 10 grams of butter-fat per day was given to the smaller and less thrifty animal, which was nearly dead. This pig improved rapidly in condition while the other continued to show the decided effect of the vitamine deficiency, but no sign of xerophthalmia. From our experience with this ra-

Another of the Many Types of Conditions in Domestic Animals in which Zecha's Stitch may be used to advantage as a "Tying Off" Process before Ablation Others are Mammary Tumors of Bitches and Sows, Shoeboils of Horses and Many Less Significant Growths

In growths such as shown in the illustration herewith, a line of sutures traversing the pedunclc and drawn taut after proper preparation of the suture line by shaving and disinfection, will make the ablation safe and bloodless.

tion, not all detailed here, we are inclined to class the pig with the rat in that it probably requires less Vitamine A than the rabbit. Its need for this particular vitamine, however, is here demonstrated to be great enough to make the question of practical importance when pigs are fed without access to pasture or forage. The white corn ration noted above was made up from common feeding materials and so constituted as to supply, with its supplementary salt mixture, good quality of protein and all other dietary essentials except that it was deficient in Vitamine A.

"The same ration was fed to both rabbits and rats, to make possible further comparisons between these species. Its marked deficiency in Vitamine A was demonstrated by the fact that it quickly caused xerophthalmia and death in rabbit 81 after 6 weeks on the ration. Rabbit 80 showed slight xerophthalmia at the same time, but was cured and grew normally thereafter with the addition of 5 per cent butter fat to the ration. Four rats on the same ration grew fairly well showing growth curves slightly below the normal, and reached maturity but the young which were born were not suckled and died in a few hours or were eaten, a characteristic effect of deficient rations.

*American Journal of Physiology 59: 335-345 1 f. 4 charts.

TULAREMIA

Tularemia is a specific infective disease of rodents and humans caused by the B. tularense. This disease is transmitted from infected rodents to man by the bite of an insect or by direct infection by the dissection or autopsy of infected rodents. This disease is especially of interest to laboratorians although several cases have been identified in rural people.

Occurrence. The disease in rodents is quite wide-spread having been identified in the ground squirrel of California, jack rabbits of Utah, and cotton tail rabbits of Indiana.

Several cases of the disease in the human have occurred in Utah. Other cases may have occurred in various locations but probably have not been recognized. Several cases have occurred in laboratory workers.

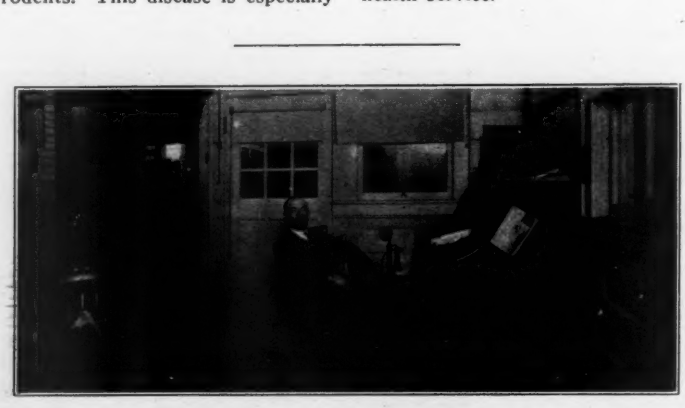
Cause. The specific cause of the disease is the B. tularense. This micro-organism was discovered and named by McCoy in 1912. This organism is non-motile and Gram negative. It does not grow on ordinary culture media.

Transmission. The disease may be transmitted by direct inoculation from an infected rodent but is usually transmitted by a blood sucking fly or parasite.

The rabbit louse (Haemodipsus ventricosus), the bed bug (Cimex lectularis) and at least one blood sucking fly (Chrysops discalis) are capable of transmitting the disease from rodent to rodent and from rodent to man.

Symptoms. The first evidence of the disease is manifested at the site of the insect bite or related lymph gland. The site of the bite becomes necrotic, suppurates and sloughs the lymph gland, becomes tender and painful and undergoes suppuration. There are usually general symptoms manifesting a low grade septic infection.

This disease is briefly recorded because it should be of interest to veterinarians. The present knowledge of the disease has been determined by investigations of the U. S. public health service.



Dr. H. E. Hershey in the Office of His New Hospital at Charleston, West Virginia

Studies on Periodic Opthalmia in the Horse

First Contribution

By Augusto Bonazzi and Edward Merillat, Wooster, Ohio, U. S. A.

(Continued from May Issue)

In spite of the fact that these experiments and their results are of a preliminary nature and are thus presented, it is the belief of the present authors that they indicate a succession of phenomena which take place in the development of the disease and which if recognized will open a line of attack that will yield results of value.

The recognition of the various phases in the disease, each with its special symptom complex takes the place of the indefinite picture of difficult diagnosis and uncertain meaning. The fact that the externally visible changes in the eye are linked to definite internal disturbances and that some of these may be duplicated in experimental conditions, by the use of pure cultures, is indicative of the results to be obtained by a systematic attack of the problem.

The tendency in the past has been to search for a curative of rapid and sure application, but it is the aim of the present authors to spend some time on the question of diagnosis in the early phases of the disease at a time when the disturbance is not recognizable from other conditions often referred to as acclimatation troubles. This is especially important in view of the fact that the negative results obtained in the present investigation as well as by Avery, in some cases, when attempts were made to transmit the condition by direct cross inoculation, point to the possibility that the natural disturbance far from leading to complete blindness in a short time is sometimes limited to a slight transitory disturbance often overlooked, treated symptomatically without leading to the final fatal termination syndrome. These cases are potentially important cases as they constitute the resistant types of animal which should be closely studied and used for breeding purposes. A sure means of diagnosis in these cases capable of indicating whether the animals under examination are in reality suffering from a mild case of periodic ophthalmia and are capable in the long run of overcoming the affection by natural means would only serve to discriminate among animals for breeding with the result of a betterment of the equine population of a region. Unfortunately at present there is not even a means of sure diagnosis in spite of the fact that a fair portion of the practicing veterinarians make light of the affection.

It is not the aim of the present authors to prepare a curative vaccine with the culture obtained and it should be also remembered in this connection that the "nerve" bacillus of Dalling was itself found destitute of agglutinability in the hands of Knowles. The present form, obtained during these investigations failed to be agglutinated by the blood of animals in the last stages of the disease, and in view of the type of the disturbance this is not surprising. The affection from all indications, is one of the nervous system the infective agents so far discovered being localized in the optic nerve to the greatest extent, so that responses in the blood stream can but be slow.

The other question which should be closely investigated is the path of entrance of the

A Corner of Hershey's Operating Room

organism in the organ and the mechanism of localization, and it is the opinion of the present authors that another line of attack will here be necessary to insure the transmissal of the disease from one animal to another. The transfer of the humours of the eye appears to be a very unsatisfactory means to obtain reliable results and another method may have to be devised.

In concluding this first part of the contribution it is to be emphasized that the disease is far from being understood, and that its great prevalence in some localities would justify a careful study. Fortunately it appears as if the disease is localized to the family of the solipeds.

Fig. 1
1 and 2—Stallions showing the condition of eyes during the early stages of the disease. No. 1—Indicating the condition of an eye in the incipient stages of clouding, and No. 2 showing the same eye six weeks later. At this time the aqueous was cloudy.

Pathogenesis

A careful examination of the obtainable literature on the subject of periodic ophthalmia together with our experimental findings lead us to the conclusion that the cause of the disease is still undetermined. The development, course and termination have been well considered long ago, and we have but little to add to the traditional symptomatology; nevertheless during our investigation we classed the symptoms into (1) **Premonitory** and, (2) **Pathognomonic,** and studied them as they appeared in order to account for the phenomena from a physiological and pathologic standpoint and to gain an insight into the cause of the systemic disturbances which give rise to these symptoms. In doing this we have correlated and applied information gathered from various sources; (a) from the literature on the subject as well as our experience with the disease in Chicago while engaged in the practice of veterinary medicine; (b) data obtained while field veterinarian for the Illinois Stallion Registration board; (c) observations made while a veterinarian for the British Remount Service, and (d) deductions made while experimenting with the disease during the winter of 1920-1921 in Wooster, Ohio, the results of which investigation are reported in this paper.

These various sources of information will be separately considered in the following paragraphs.

The deductions drawn from the experiments conducted by the present authors to determine the cause of the disease have been summarized in the first part of this contribution and need not be repeated here.

The following cases were used for clinical and experimental purposes:

Case No. 1.—A gray mare 12 years old. Blind. The eyes were used as bacteriological and pathological specimens.

Case No. 2.—A sorrel mare, 12 years old, with one good eye was used as a source of infective material for inoculation in animals and culture media. The animal was destroyed to obtain specimens later.

Case No. 3.—A gray gelding (Swartz) aged. From an affected herd but with good eyes. Experimentally inoculated then destroyed in order to obtain pathological specimens.

Case No. 4.—A gray mare (Metcalf) 8 years old, blind of one eye although owner was not aware of the fact. Destroyed for post mortem examination and eyes preserved for bacteriological, and other purposes.

Case No. 5.—A bay mare (Mellinger), 25 years old, and blind of left eye. Suffering from acute attack in right eye. Destroyed and eyes preserved for various purposes.

Case No. 6.—A gray gelding 10 years old and blind. No history obtainable. The animal was used for ophthalmoscopic study then sold.

Case No. 7.—A bay mare (Swartz) 15 years old and with sound eyes. Inoculated experimentally then pastured and sold.

Case No. 8.—A brown gelding (Wright and Merillat) 6 years old used for clinical study. A complete history of the case is on hand.

Case No. 9.—A bay gelding (Merillat) 13 years old, used for clinical study. Complete history on hand. The animal now at the Meadows Stock Farm under observation. for traumatic injury.

Case number 1, was a blind gray mare seen on consultation with Dr. Wm. Kinney of this

city; her condition was diagnosed as bilateral pneumonia and the prognosis was unfavorable. As Dr. Bonazzi contemplated a series of experiments on periodic ophthalmia, her eyes attracted the attention of the present author being very good specimens for a beginning. The owner was informed to communicate di-

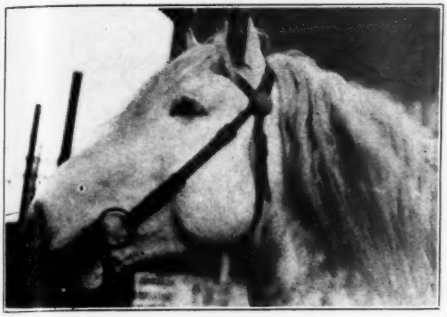


Fig. 2

rectly, immediately after the animal's death, so as to facilitate extraction of the eyes immediately. The next day the animal was destroyed and sent to the rendering plant where the author held a post mortem and obtained the eyes as his fee for the examination. The eyes were taken to Dr. Bonazzi's laboratory to constitute the starting point of the present investigation. The bacteriology and pathology of the specimens were studied and a line of experimentation planned in order to gain an insight into the disease.

This led to the purchase of cases No. 2, 3, 6, and 7, the renting of a stable, and to the employment of a man to care for the animals.

The histories of cases No. 2, 3, 6, and 7 are described elsewhere, and for want of space and to avoid repetition will be given here only a passing mention. These cases, as has been stated above, were used for experimental purposes. Horses No. 4 and 5 were destroyed at the same time and place. Number 4 had a large keloid which rendered it useless, while number 5 was an old family mare too old for service.

Horse No. 8 was a brown gelding 6 years old, owned by Wright and Merillat in Chicago, bought from a dealer in September, 1909, to be used as a driver and driven personally for purposes of observation for three consecutive years. Two weeks after purchase the animal became sick and the diagnosis pronounced as stock yard fever. After recovery he was driven every day, Sunday included, until December (2½ months after first "complex") when he became sick again and was placed by the man in attendance in a "string" of pink eye cases for three weeks. He was then placed again among the drivers but could not stand the morning work due to subnormal condition. Driven every day in the afternoon to the Chicago Veterinary College (about one mile) the horse was allowed to stand in a driveway inside the College buildings from one to three p. m. every day. During these hours Dr. Hughes held his clinics on lameness and after exhausting all available clinical material the class would use this horse as a subject for diagnosis. Soon the students learned that while some days he was lame in front other days he was lame at the other end; sometimes on one foot, other times on two or three.

In March the subject had his first diagnosed attack of periodic ophthalmia. In May, 1910, eight months after purchase and three months after the first complex he had an attack that lasted six weeks; before the first eye cleared up the other became affected. In September 1910, four months after the last and eight months after the first diagnosed attacks, he had another attack, and from that time on always had one eye affected becoming totally

3—An acute attack, sometime during the progress of periodic ophthalmia, with purulent lachrimations.

blind the following March, 1911, six months after the last attack and about one year after the first diagnosed attack of periodic ophthalmia. One year and six months had elapsed since the appearance of the first premonitory symptoms.

Case number 9 was a four year old gelding shipped from Chicago to the Meadows Stock

Farm, Orrville, Ohio, in 1912. The horse was a patient in one of the large veterinary hospitals in Chicago for fracture to the first rib and was sent to the Meadows Farm for observation.

In the spring of 1913 he was used in putting out the spring crops, became sick and was treated by a local veterinarian for acclimatation fever and as he responded to treatment the diagnosis was considered correct. In June, 1914, at the hay harvest, 14 months after the first complex of pathologic symptoms he became sick again and the condition was personally diagnosed by the author as pink eye. About six weeks later he became lame, sore and "stiff all over" and was treated for rheumatism but did not respond to treatment very well; he had a sleepy appearance with eyelids partly closed, but no perceptible lachrimation; a congestion of the conjuntiva, eyelids and eye brows were the only symptoms noticed. This third appearance of pathologic symptoms, however, cleared up in a short time. In October, 1915, two years and five months after the first subnormal period and 13 months after the last the horse developed sore eyes again.

Fig. 4

4, 5 and 6—Stallions showing various conditions in the intervals between "complexes." Here the extraocular structures have acquired a definite physiognomy; an idiosincrasis for the disease.

The attack lasted about twenty days after which time the horse appeared as though he had recovered, but his eyes were blue and always appeared blue after that; probably they had been so in 1913, 1914 and 1915, but were not noticed since all that ever interested us in the case was the atrophy of the shoulder and arm.

During the year 1916 he had no recurrence of the disease, but his sight was impaired as he would shy at solid objects, stumps, boulders, etc., either in the field or on the road.

In April, 1917, 18 months after the last and in fact the first diagnosed attack he had another attack of periodic ophthalmia which lasted over four weeks; first in one eye then the other, and his sight remained decidedly impaired until the spring of 1919, two years after, when the intervals became more frequent, ranging from eight to four weeks each, until he became blind in May, 1921. Thus, from June, 1913, when he first became sick, to May, 1921, when he became totally blind, this horse had shown six subnormal periods, i. e., during the lapse of eight years.

Symptomatology

The premonitory symptoms of cases number 8 and 9 correlate by steps in their development, and the question arises: **"Does this correlation exist in every collection of cases?"** The only difference between the two cases under examination lies in the time for the appearance of the separate symptoms. In number 8, the time for the completion of the full path of the disease visible on clinical examination was one year and one half, whereas in case number 9 this same period was protracted over eight years. In each case the intervals between periods of subnormal complex were distinctly variable. For the sake of convenience we have called each of the premonitory attacks a **complex** (of symptoms) and the cause or force regulating the variability of the intervals between complexes a function.

In the following pages are gathered the results of a series of surveys made during the course of the present investigation in order to obtain data on the following points:

A—Type and time of appearance of first complex.

B—Morbidity of periodic ophthalmia.

C—Influence of mesological conditions.

D—Influence of diet.

E—Age at which horses become blind.

They will be presented separately to facilitate interpretations. **Time and type of appearance of first complex.** Eleven histories obtained from the owners showed that five horses were raised by the owner, the first complex to appear being diagnosed as influenza at the age of three and four years. Four histories were of horses bought from shippers at horse sales and the first complex appearing was acclimatation fever according to the owner's diagnosis. One history was from a horse purchased at a public sale the first complex was diagnosed as

distemper, but no abscesses were found at the time. This horse had also several attacks of "pink eye" following the distemper, but the owner could not recall the length of the intervals between attacks. One history was of a horse purchased from a horse dealer; the animal contracted epizootic from the neighbor's horses according to the statement of the owner.

In experimental cases number 1 and 5, the first complex was influenza and number 6 which had been purchased by the owner two years before it was used in the present investigation was not known by the owner himself to be blind of one eye. Numbers 8 and 9 beyond a doubt had influenza as a first complex.

Fig. 5

Thus summarizing we find that in 9 out of 16 histories, influenza was the first complex or 60 per cent of the cases, followed by 26.6 per cent of cases which developed acclimatation fever as a prodromic symptom, 6.6 per cent distemper and 6.6 per cent epizcotic. According to this survey there is no doubt but that the first complex is influenza in the majority of cases, since the cases showing distemper and epizootic may well be thrown in the first would not be accurate enough to differentiate between these conditions and influenza.

Morbidity of Periodic Ophthalmia

Counts were made of horses in Wooster and vicinity by one of the authors with the results class due to the fact that the owner's diagnosis given in the accompanying table No. 1.

Another survey made during the months of April and May, 1921, by the other author in the streets of the city of Wooster showed on a total of 93 horses, 14 blind ones; giving a percentage morbidity of 15.05. It may, therefore, be stated that at least 15 per cent of the horses in the region studied are victims of periodic ophthalmia.

Mesological Survey

This survey was made with the aim of determining the housing conditions of horses suffering with the disease. The results obtained may be summarized as follows:

11 cases were kept in bank-barn stables.
6 cases were kept in common, well lighted stables.
4 cases under unknown conditions.
1 case was kept in a stall with a front window. South exposure.

From this survey no deductions can be drawn, but it is the opinion of the authors that the mesology of the disease should be studied more thoroughly. The actinic influence which light has, may prove an important factor in the pathology of the disease and its development, more so than it is generally given credit for. However, this survey is here given only as a beginning and this phase of the subject will be left for future consideration.

Fig. 6

No. of survey	Date	Where count was made	Total number of horses	Number of blind horses	Percent
1	Nov. 6, 1920	Country north of Wooster	20	1	5
2	Nov. 13, 1920	City of Wooster	21	3	14.28
3	Nov. 21, 1920	City of Wooster churches	24	5	20.34
4	Dec. 18, 1920	Apple Creek, Maysville, and Mount Eaton	30	5	16.66
5	Dec. 31, 1920	City of Wooster	50	8	16.00
		Total	145	22	.....
		Average	...	..	15.17

Dietetic Survey

In view of the fact that the prodromic symptoms are often of a systemic character, it was thought that a survey of the feeding of horses would prove of interest. The appended summary is the result of a survey of herds. Cases appearing in these herds would cause the whole herd to be considered as a unit of feeding with the results that follow.

6 cases were found in herds fed on corn, hay or straw during winter, with oats, corn, hay and pasture in summer.

5 cases were found in herds fed timothy hay in winter, with oats, corn, hay and pasture in summer.

5 cases were found in herds fed mixed hay only in winter, with oats, corn and hay in summer, when at work. Never pastured during working season, only between seasons.

4 cases were from herds fed on corn and oats only when worked, with hay or pasture when not worked.

1 case from herd fed on hay or straw during the winter with corn, oats and hay during the summer. Pastured when not working and always conditioned before being put to work.

1 case from herd fed on corn, oats and mixed hay in winter with oats and timothy hay in summer. Never pastured.

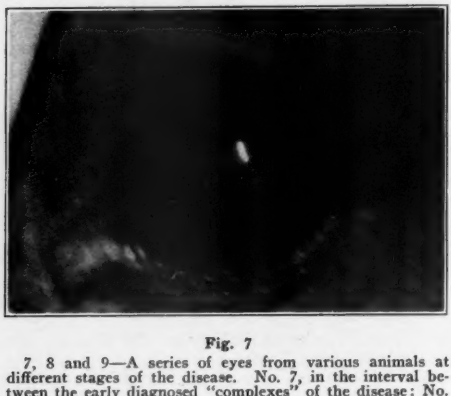


Fig. 7

7, 8 and 9—A series of eyes from various animals at different stages of the disease. No. 7, in the interval between the early diagnosed "complexes" of the disease; No. 8, after some time, between advanced "complexes"; No. 9, in the terminal intervals, showing permanent atrophy of extraocular structures.

Bran was mentioned by none of the above mentioned owners, so that there is no opportunity to attribute some of these conditions to the disease commonly known as **bran-disease.** These horses were carefully classed according to the similarities in the systems of feeding and regime of working.

If this survey were to be repeated and extended, as indeed it should, the individual stables should be given careful attention as well as each animal, so as to gain an insight into the possible predisposing or aggravating causes.

Two observations can be made from the above survey; (a) farm horses are never kept in good physical condition for work, they are "let down" and expected to "come back" without proper treatment such as good food and carefully planned exercise and (b) the diet of work horses does not vary much, consisting generally of grain, hay and pasture. It is only occasionally that a herd is found which is fed exclusively on mixed hay. These two facts should receive more than a passing notice. We cannot recall a single case of periodic ophthalmia among the working stock of a well regulated Chicago transportation company operating several hundred animals. Nevertheless this condition was often seen to develop among the horses which were being prepared for the working stock of such companies.

A survey of the age at which horses become blind may be compiled from a total of 22 cases examined or experimented upon.

1 became blind at 7 years of age.
6 became blind at 8 years of age.
8 became blind at 10 years of age.
5 became blind at 11 years of age.
1 became blind at 13 years of age.
1 became blind at 25 years of age.

This survey shows that none of the horses examined became blind at 9 or 12 years of age, but this may be due to the fact that the total number of animals examined was not very extensive. There is absolute certainty as to the age when cases No. 5, 8 and 9 as o among the experimental animals became blind. For the remainder of the animals, presented in the above table, the owner's statement was accepted.

It may be stated, however, that this is only a provincial survey and that for a full knowledge of the disease it is desirable and in fact absolutely essential to repeat it in a number of regions and states where the disease has gained a foothold and become prevalent.

At present the results thus far obtained seem to indicate that blindness generally occurs about the end of the adult and the inception of the senile period. This, however, is influenced by the **function** which regulates the variability of the period intervals between succeeding **complexes.** Whether this is de-

pendent upon dietetic or hygienic conditions or functional hygiene is still undetermined.

The premonitory symptoms have been found to be generally diagnosed as influenza acclimatation fever (in the country) or stock yard fever (in Chicago), rheumatism, arthritis of the articulations of the appendicular skeleton, synovitis of the sheath of digital flexors followed all by a drowsiness, contraction of the muscles of the eyelid (frowning) modified race habits, standing in abnormal positions (rheu-

Fig. 8

matism), sniffling, sneezing and lachrimation. The temperature ranges between 101 and 103° F. and the pulse remains normal. Respiration becomes abdominal. There is a tendency to chill. The animal avoids light without any particular fear of it, by eating hay with the head hanging in the manger, or placing it in a position where the light is intercepted. The special senses become more sensitive except the sense of vision which is slowly becoming impaired. The animal becomes hypersensitive (in most cases) to the application of grooming utensils, harness, saddles and bridle (hyperthesia). The noises made by using stable utensils, forks, brooms, buckets, etc., produce excitement through audition (hyperacusis).

The complex accompanied by the first ocular invasion presents palpebral and ocular conditions that resemble the previous complex with the exception of the physiology of accommodation which gradually decreases in efficiency until the sight is completely destroyed.

The pathognomonic symptoms follow. Congestion of conjuntiva and eyelids, tonic contraction of palpebral muscle and sometimes of the posterior rectus muscle followed all by atrophy and wrinkling of the eyelids and eyebrows. Cloudiness of the acqueous humor, contraction of the pupil, disintegration of the iris, followed by the crowding of the lense forward and sometimes by its detachment. Frowning, nictitation, lachrimation, photophobia, nyctalopia and niphotyphlosis and sometimes nyctophobia in certain stages of the disease are common symptoms.

There is nothing obscure about the symptoms, except the variation and intensity of the attacks which terminate in a progressive destructive process that end in the loss of the physiological function of the organ not only but of all the anatomical structures involved. (See Figs. 4, 5 and 11.)

General Conclusions

From the above study the following conclusions may be drawn as a guide to further study of the subject.

1. There is a definite sequence of internal disturbances which have been classified as stages of **inception, involvement** and **resolution** leading to complete blindness of the horse, not only, but to final picture characterized by the breakdown of the internal structures of the eye and frequent formation of a fibroma like development at the apex of the optic nerve.

2. An organism (Bacillus A) isolated from the humors of the eye, and found also in the optic nerve, has been studied with the result that it was found capable of reproducing the typical clinical symptoms with a limited recurrence. This organism is not, however, con-

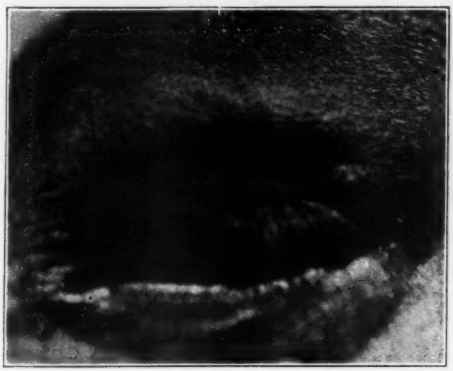


Fig. 9

sidered by the authors as **"the causal agent"** of the disease; nevertheless its presence in the optic nerve justifies the hypothesis that it plays

an important rôle as one of the organisms of a flora which will be studied in the future.

3. The period in life when a horse appears to be most susceptible to the disease is at the transition between the period of maturity and senility. This may explain the apparent failures in the experimental work when old animals were used for inoculation purposes. Future work will require the study of animals in the early period of maturity.

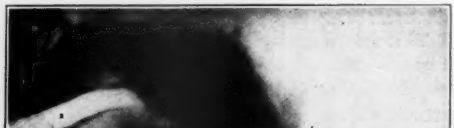


Fig. 10

10 and 11—Different views of the same eye showing the grayish crescent, in the aqueous, on the lower margin of the anterior chamber, during the early period of involvement. No information could be obtained as to the duration of the attack, then running its course, or of the number and severity of the previous attacks.

4. The conditions leading to the development of a susceptibility have as yet not been exactly determined. Nevertheless, there are indications that hereditary predisposition may play an active rôle. A survey of the mesological conditions, and of the factor of lighting in particular, should be given careful consideration as factors of a predisposing or aggravating nature.

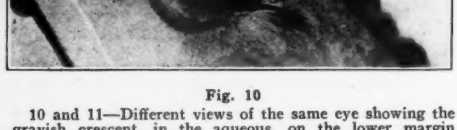


Fig. 11

5. The importance of the type, and time of appearance, of the first symptom complex may have a deep seated influence upon the subsequent development of the disease. The course followed is extremely long and may vary according to whether the first complex was an attack of influenza or some other pathological condition. The time of completion of the full cycle and the severity of the attacks are thus deeply influenced by the type of previous history.

One horse among the experimental cases used in the present investigation was suspected of having a natural or acquired immunity to the disease (case No. 7): the animal had been in a stable, harboring an affected herd, for several years without acquiring the disease. This case opened up the question of immunity and hereditary susceptibility.

The experience gathered in the stallion Registration Board of the State of Illinois allows only of the statement that the disease is never sporadic. When the so-called sporadic cases are traced by means of pedigree or bill of sales they are found to constitute a provincial, not a providential sin. The same obstacles were met with in examining stallions as in general practice: a correct history of cases is seldom obtained. Histories from two or three sources may be proffered, however. The one, from parties pretentially disinterested, the other from parties with opposite interests, and the third from parties equally interested in the deductions obtained from a correct history.

It should be stated here that although periodic ophthalmia is not the only cause of blindness, in horses it is in the final stage easy to differentiate from blindness resulting from other causes. Periodic ophthalmia does not end with the blindness it causes, but continues advancing until all the structures of the eye are destroyed except the external coat (Fig. 12). This fact will be referred to in a later page.

Observations and deductions made while in the British Remount service contributed nothing to the knowledge of the cause, development course or termination of the disease. A great deal was nevertheless learned about the handling and traffiking in this class of horses for military purposes. Horses with defective

Comment: Therapeutic and prophylactic data gathered at random and during these observations and studies will be published in the July issue.—Ed.

CHRONIC URTICARIA

Some time ago I reported a case which was directed to you for help, but got no results whatever from your suggestions.

I shall restate the case and hope to receive your opinion as a great deal depends upon the outcome of this case.

The horse is a 1700 pound black gelding, eight years old, of blocky build and an easy keeper. Each summer for the last few years, he has had an attack of urticaria which subsided with the coming of the cold weather, but last fall the disorder failed to subside and now he is covered with many thickened patches over his body, ranging from one-half inch to two inches in diameter. His poll and withers are considerably thickened and enlarged and gives the semblance of poll-evil and fistula of the withers. At the lower part of the collar on the breast, there is a considerable thickening.

Horse has been fed good dry feed for several years and had moderately light work every week day until put on treatment by a nongraduate here before my arrival at this location. This man took two gallons of blood from the animal twice, at two week intervals and had him turned on pasture at night.

The horse was turned over to me and I began administering 45 grain doses of sodium cacodylate intravenously every three days until about six doses were given. The first three doses seemed to give considerable relief. The skin softened up and some knots left him. Then no further good seemed to be derived.

I diagnosed the case as chronic urticaria, although the horse shows very little itching or irritation of the skin. On the tip of a few of the enlargements is a small spot devoid of hair, but these are very few.

Please give me your opinion. I have never seen or heard of a case like this before.—E. L. H., Illinois.

REPLY (By Dr. Quitman): I fully agree with your diagnosis of chronic urticaria in the case described by you. Referring to the treatment it is my opinion that you were on the right track when you prescribed sodium cacodylate, but failed to get the desired results because of two errors in the technic of its administration in this case.

A horse weighing 1700 pounds should receive a dose of sixty to sixty-five or even seventy grains administered on every fourth day, (that is at three day intervals) and it should not have been administered intravenously. It should have been administered subcutaneously. When given in the blood stream it is taken up too rapidly for the best effects except in acute or peracute conditions.

Try it again as suggested in the foregoing and I believe you will be successful this time with six to eight doses. I have had only favorable results from the drug in just such cases.

Should it fail, however, in your case, place your patient on the following treatment:

Sodil bicarb.....
Carbo ligni .....aa ℥xij
Sulphur sub. ..... ℥xxxij
Misce et div. in pulv. No. xvi.

Sig. One powder in the feed three times daily.

In addition, prescribe six dram doses of Fowler's solution three times daily which may also be mixed with the animal's feed. The patient should receive a bran mash every night.

External applications except to allay itching are of no value. Hair growth on denuded spots may be stimulated by daily applications of petrolatum and of tincture of iodin every third day.

No Study of Summer Sores Made in This Country

What are called summer sores occur in the United States and were discussed at the last meeting of the Illinois State Veterinary Medical Association. Dr. Sigler reported them in jacks and horses in Indiana and Dr. Quitman discussed their occurrence in Illinois. As yet we have had no studies of summer sores in this country in which the finding of the larval **Habronema** has been reported. This is a matter which deserves attention. The treatment most strongly recommended for this condition is early and complete ablation of the affected tissues. Dr. Quitman states that the application of a paste composed of 1 part arsenic and 5 parts flour accomplishes this result in a more satisfactory manner than surgical measures. Prophylaxis consists in protecting surgical wounds and other skin agrasions from flies, by the use of bandages or suitable dressings and repellents.

Purely Practical

Uncertain gait, standing on toes, shifting lameness and normal appetite are usually the initial symptoms of rickets in pigs.

Thumping, unthriftiness, coughing, depression and irregular appetite are the usual symptoms of pulmonary ascaridosis in suckling pigs.

High temperature, tendency to hide in bedding, and inappetence are prominent symptoms of hog cholera. The diagnosis should be verified by an autopsy.

Temperature of 104-105° F., unthriftiness, diarrhoea, appetite normal or slightly impaired is indicative of infectious necrotic enteritis in swine.

High temperature, thumping, tendency to hide in bedding, and inappetence occurring in a large percentage of the herd is suggestive of influenza in swine.

Wheezing respiration and paroxysms of coughing characterizes parasitic bronchitis. The diagnosis in these cases can be verified by identification of the parasites or their eggs in the nasal discharge.

Runty pigs are probably indicative of a uterine infection of insufficient intensity to destroy the pig in utero. It is economical to destroy runts immediately after farrowing.

It has frequently been stated that the hydrochloric acid of the gastric juice of the human was sufficiently antiseptic to destroy ingested bacteria. It has been recently demonstrated that the gastric juice is only feebly antiseptic and that it will not prevent infection.

Recent experiments indicate that the spleen has no influence on the production of pancreatic, gastric or biliary secretions, neither does it have any relation to the gastric or intestinal motion. The removal of the spleen does not affect the growth or the demand for food.

It is said that infections of the uterus play a more important part in the sterility of mares than in that of cows.

In performing cesarean section in a sow or bitch do not make the incision in the uterus too near the os uteri. If you do, you will find the incision more difficult to suture than if it is made farther back.—H. C. Groff.

Present knowledge would indicate that the prevention of salpingitis rests in the control of retained placenta and the prevention of cervicitis.—DeVine.

A solution of pyroktanin to which a little glycerin is added is the best treatment for scratches in horses we have used.—Blank.

"In the individual treatment of ocular roup the patients must be fed, since they can not see well enough, even, in slight cases, to select food thrown to them. We have good success with Calcidin, 1 to 2½ grains twice a day."—Blank.

ANTISEPTIC FOR HYPODERMIC SYRINGES

The following antiseptic is recommended by Dr. C. H. Shultz to keep hypodermic, or in fact any, syringe pure and in good working order: Equal parts of glycerin and water, 5 per cent liquor cresolis and enough fuchsin to color. The mixture is drawn into the syringe with needle attached and set aside until needed. The glass is kept smooth and the plunger in good state of preservation, and the needle will not rust.

Before beginning work the mixture is syringed out and a few drops of the biologic to be used is drawn in and immediately rejected before it is refilled to begin the injections. When a large number of animals are being injected the syringe is refilled with the mixture from time to time. The sum of the process is a clean, smooth-running syringe and a minimum of danger from infections.

Cattle Practice

Edited by JOHN FRANCIS DE VINE, D. V. S.

Professor of Bovine Medicine, New York State Veterinary College at New York University, New York City.

Immunization of Cattle Against Contagious Abortion

Excerpted for Veterinary Medicine, by C. H. Schultz, Chicago, Illinois.

A most interesting and comprehensive article on the subject of artificial immunization of cattle against abortion disease is published in volume 52 of the official publication of the department of health of the German states. (Arbeiten aus dem Reichs Gesundheits Amtes.)

During the period of 1911-1915, 5,135 cows and heifers from 123 herds were treated with five different vaccines with the object of demonstrating whether active or passive immunity that would prevent abortion can be produced by artificial methods. Live as well as killed cultures of the abortion bacillus were used.

1. **Live cultures.** Two agar slant cultures, eight days old, were washed with five cubic centimeters of physiological salt solution and kept in brown-glass vials and ten cubic centimeters of this bacterial emulsion was used for each injection on non-pregnant cows and heifers. In infected herds it was used on animals that had calved as well as on heifers that had been exposed. Only one injection of these live cultures was given to each animal. The injections were intended to demonstrate:

(a) Whether such injections of live cultures would hasten immunity in animals already infected.

(b) Whether non-infected animals, not pregnant but exposed to severe infection, can be protected against infection by injections of live cultures.

2. **Killed cultures.** Killed cultures were grown in different ways and used in different quantities and concentrations. Cultures grown for three weeks in flasks of English bouillon to which amniotic fluid was added were killed by heating two hours at 55° Centigrade. Thirty cubic centimeters of this emulsion were injected subcutaneously. In later experiments 14 days bouillon cultures were killed and 100 cubic centimeters of the emulsion were injected and repeated in four to eight weeks. There experiments were intended to demonstrate, if and to what extent, active immunization can be produced with killed cultures.

3. **Live cultures plus serum from immune animals** were used on pregnant cows and heifers. This was done to avoid the pathogenic effects caused by live bacilli when injected simultaneously with anti-serum, without lessening the immunizing effect.

4. **Killed cultures plus serum from immune animals** were also used on a large number of pregnant animals in order that the toxic effects of the vaccine be prevented and also to produce passive as well as active immunity.

5. **Attenuated cultures.** These were used in a few infected herds when immunizing your heifers and calves. The bacilli were attenuated in order to prevent infection and dissemination of bacilli by vaccinated animals.

No antiseptics were added to any of the bacterial emulsions or sera used in the experiments.

6. **Contagious abortion immune serum.** Seventy-six calves in three infected herds were each injected with 50 cubic centimeters on this serum. In all three herds diarrhea almost entirely disappeared, while before the injections most of them died before they were two weeks old, or remained weak for a long time. Only three of the calves injected died from diarrhea.

After careful consideration of the results of their experiments the authors state that the simplest and best method to immunize animals against abortions disease would be to inject:

(A) **Infected pregnant animals** with two injections of killed cultures two to four weeks apart.

(B) **Infected non-pregnant animals** with two injections of live cultures also two to four weeks apart.

(C) **Non-infected pregnant animals** two injections of killed cultures two to four weeks apart.

(D) **Non-infected non-pregnant animals** (a) in herds where the infection is mild two injections of killed cultures two weeks apart and (b) in herds severely infected, two injections of live cultures two to four weeks apart, and the cows bred no sooner than eight weeks after the second injection.

According to their views these methods, as well as all others with which they are familiar, are not altogether satisfactory and an improvement in the vaccines is very desirable. Prophylactic and hygienic measures are recommended as important.

The Final Conclusions

They have carefully tabulated and analysed the results on 3,006 animals in 80 herds. Among these 1,650 were injected with four different vaccines and immune sera while 1,356 were used as controls. The following vaccines were used:

(a) Killed cultures of abortion bacilli on pregnant and non-pregnant animals.

(b) Killed cultures plus immune serum on pregnant animals.

(c) Live cultures on non-pregnant animals.

(d) Live cultures plus immune serum on pregnant animals.

(e) Serum from immune animals on animals in advanced pregnancy. The final conclusions shows that:

(1) After the different vaccines the total number of abortions were reduced from 25.21% to 15.15%. Among the controls abortions increased from 16.31% to 22.68% showing that the decrease was due to the injections of the vaccines.

(2) The number of abortions decreased: (a) after injections with killed cultures, from 18.51% to 13.20%; (b) after injections with killed cultures plus immune serum, from 21.76% to 13.60%; (c) after injections with live cultures, from 29.09% to 6.36%; and after injections with live cultures plus serum, from 16.36% to 5.45%.

(3) It was not possible to produce passive immunity during advanced pregnancy, and no definite conclusions could be drawn from the results obtained from injections of the attenuated cultures which were used in a few herds.

(4) No difference could be noted in the production of artificial immunity among sexually mature animals of different ages, but it was found to be more difficult to produce immunity in calves and young animals not sexually mature.

(5) Animals may be vaccinated at any stage of pregnancy with killed cultures or with live cultures plus immune serum, one part to ten, without disturbing the normal course of fetal development.

(6) Vaccination during pregnancy favors the production of immunity. It is therefore less difficult to immunize non-infected pregnant animals than animals that are not pregnant.

(7) Animals that have already calved can be immunized by injections of live cultures during the time they are not pregnant and thus be prevented from aborting the second time.

(8) The period of immunity among animals injected with the same vaccine often varies in a marked degree. Two injections with killed cultures will, in infected or non-infected animals, seldom produce immunity that protects for more than two years against natural infection.

Since even a double injection will not always produce a lasting immunity against abortion disease in non-infected animals it becomes necessary to vaccinate infected herds repeatedly to assure permanent protection against the disease.

(9) Vaccination against abortion disease has neither favorable nor unfavorable influence on estral periods or non-conception of cows.

(10) Cases of retained afterbirths become less frequent as abortion disease disappears from a herd.

(See also Page 288)

MILK FOR ORPHANS

A country practitioner is often asked how the various species of young should be fed when left orphans. I do not find any literature on the subject and would be pleased to have some light on the subject. How should cow's milk be prepared for colts?—J. W. M., Ill.

Reply: The department of Zootechnics, April issue, page 187, gives a categorical reply to this query. The question is asked so frequently during the spring months we publish an instruction table to which all those interested in this subject may refer whenever a substitution of milk is needed to rear young orphans of any species.

Successful Operation for Traumatic Pericarditis

By Dr. T. H. Ferguson, Lake Geneva, Wis.

THE subject was a two-year old pure bred Holstein bull purchased in California by Mr. George Schuster of Mukwonago, Wisconsin, owner of a large, well-equipped farm stocked with choice cattle a few miles from that place.

The bull had been sick for about a month, responding somewhat to treatment for indigestion. I was called to operate by Dr. Herbert Lothe who was attending to Dr. J. C. Harland's practice during the latter's illness, and who was the attending veterinarian of the herd.

I examined the bull on March 22nd and found him in rather good flesh for an animal sick so long. He was, however, very weak and showed a marked edematous swelling extending from the submaxillary space to the pectoral region. The pulse was 100 and the temperature 103° Fahr. On auscultation of the heart distinct splashing sounds were heard on the left side and less pronounced ones on the right.

I concurred in Dr. Lothe's diagnosis of traumatic pericarditis and we informed the owner who was present at the examination, that the foreign body could be recovered by an operation and that such intervention was the only chance to save the bull's life. Mr. Schuster was not only willing but anxious to have this done and remained as an interested spectator during the entire ordeal.

Details of the Operation

One half hour before beginning, an ounce of chloral dissolved in a gallon of warm water, was administered with the stomach tube, which was passed without a mouth speculum and with no other restraint than the nose ring held by the herdsman.

The restraint consisted of placing the animal along a partition and holding the head by means of the halter and nose ring. The left hind leg was secured by looping a rope around the metatarsus just above the fetlock and snubbing it through a ring directly behind. This rope was held by an attendant to provide against a sudden kick.

The seat of the incision at the site of rumenotomy, was anesthetized with apothesine and adrenalin chlorid. The incision which was made through the skin in a vertical direction and through the external and internal oblique muscles along the direction of their fibers, was carried through the peritoneum and then through the rumen. The rumenotomy was five to six inches long. The edges of the rumen wound were drawn out to the exterior and a sterile cloth wrapped around it in such a manner as to cover the entire wound and environs.

On exploration a number of metallic objects and several stones were found in the reticulum, and farther forward, a piece of baling wire four or five inches long was felt protruding through the anterior wall and extending in a forward direction toward the pericardium. The distance being so great in such a large animal this palpation could only be made with difficulty at arm's length. When the wire was withdrawn the finger could trace a fibrous tract extending in a forward direction.

Whole Abdomen Explored

With the other arm which had not been soiled in these operations the whole abdominal cavity was systematically explored but nothing abnormal was found except the lesion produced by the wire.

The rumen and parietal wounds were closed in the usual manner and protected with a proper dressing.

The pericardial sac was then punctured with a trocar and canula. More than three quarts of a watery fluid was thus aspirated. The fluid, which resembled water, was without color or odor.

The animal stood the operation without visible signs of shock, which in view of its weakened conditions seemed remarkable. The following mixture was pumped into the stomach through a stomach tube: aromatic spirits of ammonia, two ounces, fluidextract of nuxvomica, two drams, fluidextract of ginger, two ounces, and water, one gallon.

The legs were bandaged, the body clothed with a warmed blanket and fluidextract of digitalis was prescribed to be given as indicated.

The case was left in charge of Drs. Harland and Lothe who at this writing (April 5th) have not found occasion to spoil a unique case report.

Treatment of Mastitis

HOWEVER slight an attack of mammitis, treatment should be prompt and vigorous, so as to curtail its seriousness, and it should be based upon elimination of the cause of the disease, relief of pain and reducing fever.

The animal should be comfortably housed and clothed, being provided with a bed of soft material, such as corn winnowings, long chopped straw or such like material if rigors and high temperature exist. I give 2-3 oz. liq. ammon. acet. fort. with 2 oz. nitrous ether and 5 m. tr. aconite; if the animal is in strong plethoric condition, a large dose of Glauber salts with treacle; if fever persists, antifebrin, tartrate of antimony and nitrate of potash three times a day. The appetite should be tempted with good clean meadow hay and clean cold water in summer, chilled in winter. Locally, I have applied to the udder thick flannels wrung out in hot water to which bicarbonate of soda has been added; these are applied frequently and over fairly long periods, followed immediately afterwards by massage of the quarter with emulsified olive or castor oil, and then thorough stripping of the teat. If one sees the case early and before thick purulent matter is in evidence, I inject blood heat sterilised solution of chinosol, 5 grs. to the pint; this I allow to remain in the gland two to three hours, in the meantime massaging and gently rubbing the udder. This I repeat on following days. When suppuration appears inevitable it should be hastened by all possible means, and, if there is but little hope that the quarter can be saved for the future secretion of milk, free incision into the gland or complete amputation of the teat should be practised. Hemorrhage may be severe, but does not last long, and can be lessened by judicious plugging of the milk sinus; this gives wonderful relief.

The occurrence of gangrene is always serious, especially when it becomes diffuse. There should be no hesitation on the part of the practitioner in advising removal of the affected parts, or if needs be the whole of the mammæ-

Technique of Ablation

The method I adopt is as follows: I cast the cow with side lines, seeing that the cow's head lies on high ground, prepare the skin and give chloroform (I use a Carlisle muzzle) up to 1½ oz. to start. This as a rule induces complete anæsthesia. I make a circular incision around the whole of the udder through the skin only about three inches distant from abdominal wall. Cutaneous hæmorrhage may be severe, but can be checked by means of artery forceps. I strip the skin from the gland tissue till I reach the abdominal wall. I then proceed with my fingers or blunt end of scalpel to separate the gland from the abdominal tunic, to which it is only loosely attached, in the meanwhile ligaturing any veins or arteries I may meet till I get to the posterior third of the top of the udder when it is necessary to proceed cautiously, as here, about three inches in from the back part of the udder and towards the median line and in front of the supra-mammary lymphatic glands, are the main blood vessels. To these I apply a strong tape ligature around the whole of the vessels above the lymphatics, and then remove all the structures below the ligature. I bring the edges of skin together with interrupted sutures, and apply freely a dry dressing of starch, chinosal and boric acid. I have had some surprisingly good results, and in cases where I am satisfied death could only have ensued.

As regards the practice of vaccine and serotherapy treatment of mammitis, I know nothing, and only hope that those of you who have practised such methods will give us their experience as to its value.

(Barry, Ext. Vet. Record, Feb., 1922.)

The feed consumed by farm animals in the United States during 1919 was valued at $1,101,228,543.00.

On Grand Turk Island, West Indies, where cow's milk is not a common food of the population, the death rate from tuberculosis was 4 per thousand between 1909 and 1913. In England it was less than one per thousand.

MILK HYPODERMICALLY AS A GALACTOGOGUE

I would like to ask through your query column if any real results have ever been obtained from the theory that some fellow advocated a year or two ago that hypodermic injections of a cow's own milk would increase the flow.—J. A. T., Va.

Reply: We have no evidence to substantiate such a claim and believe the merit of the procedure has not been proved.

Swine Practice

Edited by A. T. KINSLEY, M. S., D. V. S.

"Immunize the Spring Pigs"

A RELATIVELY small number of the pigs of the spring crop of 1921 were immunized against hog cholera. The reasons for not immunizing the 1921 spring pigs was due to the low price of swine coupled with the fact that there was very little hog cholera in the country. During the fall of 1921 hog cholera outbreaks occurred in several sections of the country and spread rapidly because of the large numbers of susceptible swine and the losses due to hog cholera in 1921 were in excess of the usual annual losses.

A repetition of the 1921 hog cholera losses during 1922 will probably occur unless there is general immunization of the spring pigs. The veterinarian is the guardian of the live stock industry and it is justifiable for him to urge his clients to have their spring pigs immunized.

The question at what age should pigs be immunized is pertinent and is worthy of consideration.

According to a report of the Bureau of Animal Industry, a permanent immunity against hog cholera can be produced in suckling pigs, even pigs not more than ten days old. Some general information has been obtained from practicing veterinarians relative to the durability of hog cholera immunity in suckling pigs and unfortunately the results have not been uniform. One veterinarian has immunized all pigs while they were suckling on the farms in his community and has had good success; however, on further investigation, it was found that there was practically no cholera in that community and therefore his report would be of little value. In several instances there has been cholera developed in swine that had been simultaneously injected with serum and cirus before they were weaned.

It is generally assumed that the younger the animal when immunized, other things equal, the shorter the period of immunity. If this assumption is correct, then it would not be justifiable to assume that an immunity in a young pig would be continuous throughout the life of the swine. It may be that an immunity produced in a suckling pig will endure in a considerable percentage of cases until the swine are fattened and marketed, provided there is no virulent outbreak of hog cholera in the immediate vicinity but it is problematic whether a suckling pig's immunity will be sufficient for breeding animals.

Many practitioners have reported the occurrence of hog cholera in herds in from 60 to 120 days after simultaneous immunization. The diagnosis of cholera in several of these instances has been proved by laboratory tests. From investigation it would appear as though there was no question as to the potency of the serum and the virulency of the virus used in some of the cases in which there was a so-called break in 60 or 90 days. Although some investigators are of the opinion that there was some defect in the virus but there is no definite proof to substantiate this theory. Is it not possible that an immunity against the filterable virus of hog cholera may be offset or overcome by some depressing or devitalizing influence such as gross errors in feeding or the occurrence of disease? There are indications that immunity against cholera may, under certain circumstances, be overcome and swine that were immune from cholera may actually become affected and die of cholera.

The method of administration of serum in pigs should receive the careful consideration of the veterinarian. The intraperitoneal injection is simple and desirable. Serum injected into the peritoneal cavity is rapidly absorbed, does not cause soreness or difficulty in locomotion, and does not damage the hams or shoulders. The intraperitoneal method is especially advantageous in 40 to 50 pound pigs for an attendant holding them by the hind legs favors the descent of the abdominal viscera and there is little or no danger of puncturing any of the visceral organs. The same precaution should be taken in making intraperitoneal injections of serum as to cleanliness and asepsis that are observed in the injections in the axillary space

or ham. The virus should be injected into the ham or axillary space. Cold serum injected into the peritoneal cavity may cause distress from shock and it is therefore advisable to have the serum for such injection about body temperature.

Cocklebur Poisoning in Swine

IT does not seem necessary to give a detailed description of the cocklebur, as, no doubt, all veterinarians are familiar with this plant. According to botanists, there are about a dozen different species of cocklebur in the United States. They all resemble each other quite closely and are similar in their habits. All cockleburs are annuals and the only plant that they might be confused with is the burdock. The cocklebur contains two seeds and during the ordinary season one of the seeds germinates, the other seed germinating the following season. This apparently insures the continued existence of this plant.

Some authorities maintain that if the season is particularly wet and the spring days warm, both seeds of a cocklebur may germinate. The cotyledon of the young cocklebur contains a glucoside that is extremely poisonous. The seed of the cocklebur contains an oil and a method has recently been perfected of extracting this oil which is claimed to be useful for the mixing of paints and also as a food for the human.

The cocklebur is responsible for the loss to live stock producers in the following way: The bur causes rather extensive losses by depreciating the value of wool from sheep and mohair from goats. Wool or mohair containing cocklebur is always docked. The cocklebur is also responsible for the production of more or less irritation of the stomach walls of practically all animals. Instances have been observed in which choke in pigs and calves has been traced to the lodging of cocklebur in the oesophagus. Other instances have been observed in which losses have resulted from the obstruction of the intestine by masses of cocklebur.

The most serious losses from cocklebur occurs in pigs and is the result of the consumption of the di-cotyledons just as they come out of the ground. These losses are then usually most prevalent in the early spring. Losses are usually reported from the southern states in the latter part of January or early February. In the middle states these losses occur in March or April and in the extreme northern states in April or May. The losses in pigs occasioned by this plant are much greater than are usually recognized. The pig is most susceptible to this trouble about weaning time. The amount of cotyledons necessary to produce disturbance in the pig varies as the toxicity of the cotyledon apparently varies. In some feeding experiments, it was found that one-fourth of a pound of the cotyledon was sufficient when fed to pigs weighing from 30 to 60 lbs., to produce fatal results. When a small quantity of the plant is consumed, a mild form of the disease follows.

Symptoms

Symptoms of cockebur poisoning usually become evident within a few hours after consumption of the plant. In those cases in which large quantities of the plant has been consumed the first evidence of the disease consists of colicky pains, the animals are restless, frequently getting up and down; they show marked distress, usually vomit freely and within a few hours a marked diarrhoea develops. The depression becomes more marked and the animals appear to be in a stupor; during the latter stages there may be periodic convulsions and death usually insues within 24 hours after first symptoms are manifested. If only small quantities of the plant are consumed, then the animal may show depression with or without vomition. There may be diarrhoea. Such animals usually show marked loss of condition and as a rule, the animals ultimately recover.

Lesions

The principal lesions evidenced in pigs dead of cocklebur poisoning consists of a marked gastro-enteritis. The extent of the lesions will depend largely upon the length of time that the pig lives after the first symptoms are evidenced. In those cases in which the pig dies within an hour or two after the first manifested symptom the lesions will be relatively insignificant. If the pig survives for 12 to 24 hours, after the first symptoms have become evident, then there will be marked lesions not only involving the gastric mucosa but also practically all of the mucosa of the entire small intestine. Swellings may be evidenced in the

parenchymatous organs because of the high temperature.

Prevention and Treatment

The losses incident to cocklebur poisoning can be prevented by eradicating the cocklebur or by preventing swine from coming in contact with soil that is infested with cocklebur during the early spring season. The treatment of pigs affected with cocklebur poisoning has not been successful. There has been no antidote found that will counteract the glucoside of the cotyledon of the cocklebur.

Symptomatic treatment is indicated and, where feasible, oleaginous substances or demulcents should be administered. In most of these cases the pigs refuse to eat and therefore it becomes necessary to administer the medicants preferably by means of a dose syringe.

VETERINARY MEDICINE will be glad to obtain reports on cocklebur poisoning in pigs and also treatment should any of our readers have a successful method of overcoming the disease. (See also Page 295)

THORN-HEADED WORM INFESTS 30,000 SWINE

We are at the present time keeping some thirty thousand hogs. Our shipments coming mostly from Texas and Colorado, but a few come from other sections.

In all our post-mortem examinations we find the presence of the thorn-headed worm in the intestines. Undoubtedly they help to lower the resistance of the animals though we never find them as the only cause of deaths. Most of the literature that I have delved into on this parasite is far from enlightening and I am looking to you for any information you can give as to their removal, the extent of their ravages and any publication which will help us to free our animals. We are anxious to co-operate with any experiments that you may suggest along this line.—L. F. C., Calif.

Reply by Maurice C. Hall: At the present time, unfortunately, we are unable to make definite recommendations as to a dependable treatment for the removal of thorn-headed worms from swine. The critical tests necessary to establish a treatment on a basis where we can speak positively in regard to its value have not been made in the case of this worm. It is only possible to cite the treatments which are given in the literature, and as the older treatments, established wholly on clinical results, have so often proven unsatisfactory on actual test in the case of treatments for other worms, we can only reserve judgment at the present time as to their value in this case.

Among the recommendations are: Turpentine in doses of 4 fluid drams for a 100-pound animal, to be given in a light feed or in skim milk for three successive feeds, treatment to be preceded by fasting and followed by 1 ounce of Epsom salts; powdered copper sulphate in doses of 1 dram for a 100-pound animal, to be given in a thick mash morning and evening, treatment to be preceded by fasting and followed by 1 ounce of Epsom salts. Dr. Peters has told the writer that carbon tetrachloride will remove thorn-headed worms, but to what extent it will remove them and in what dose it should be given we would be unable to say until critical tests have been made, such tests to involve postmortem examination of treated animals and a comparison of the number of worms recovered from the manure with the number found postmortem. It is possible that oil of chenopodium, which is quite effective in removing ascarids from swine when given in doses at the rate of 1 fluid dram in 2 ounces of castor oil to animals weighing 100 pounds, might be effective against thorn-headed worms, but we have no evidence in regard to this.

In view of the fact that the white grubs, which are the larvae of the May beetle or June bug, are the intermediate hosts of this worm, measures to prevent pigs from rooting out and eating these grubs might be useful at times. However, such preventive measures are not always feasible or desirable.

At the present time no special symptoms have been definitely associated with these worms, the effects being those customary for intestinal parasites in general, namely, unthriftiness and digestive disturbances without an associated febrile condition. They cause local inflammatory reaction with some necrosis, and occasionally perforation to the peritoneal cavity occurs, with a resultant peritonitis. Steffani reports finding the worm in the gall bladder. Alessandrini states that the worm contains a hemolysin of a colloidal nature, water-soluble but not alcohol-soluble, the action of which diminishes at 40° C. and is lost at 55° C.

Tuberculosis was the cause of 110,285 deaths in the United States during 1917. Of these 97,047 were from tuberculosis of the lungs, according to the U. S. Public Health Report of 1919.

AGE WHEN PARASITES DAMAGE HOGS MOST TO BE STUDIED

Lice and internal parasites of hogs are known to cause great losses to pork producers, but little is known about the period of the animal's life when the losses from these causes are greatest. To clear up this question the Zoological Division and the Animal Husbandry Division of the United States Department of Agriculture are co-operating on a test that will be carried on through this spring and summer. They expect to determine the comparative damage done before weaning, during growth, and while the hogs are being finished for the market. In order that conditions may be comparable to those on the farm 20 hogs will be used in each lot.

NECROBACILLOSIS IN A HERD OF PIGS

The specimen I am sending you is from a February pig in a herd that is badly affected with what I believe to be necrobacillosis. These pigs, some 75 in number, have been treated with tincture of iodin, silver nitrate and zinc chlorid. I realize that the only way to handle this trouble is to abandon the old hog lot, but often it is not possible to find suitable, non-infected quarters for a large herd, and that it is difficult to get a plan of individual treatment carried out by herdsmen. When this is done, however, I am able to save 50% of the cases, even in badly infected herds. I pack the cavity with the above mentioned drugs and have used Flavisol with good results. The owner uses the ordinary commercial dips and when these are applied the same results are obtained. It seems largely a question of caring well for each individual pig. I use copper sulphate internally for necrotic enteritis but have never applied it to the local lesions. I am wondering whether a strong solution of copper sulphate would not be advisable.—J. B. B., Ia.

Reply: The bacteriological examination of the buccal membrane specimen shows B. necrophorus in large numbers. The diagnosis of necrobacillosis is therefore correct. Salicylic acid and potassium permanganate are giving the best results. The former softens the skin and the latter is effective against anaerobic organisms.

But to harbor a herd of hogs in an environment pestered with so serious a disease, is very imprudent, and if the losses are not sufficient to jarr the owner into quitting the hog business, improving the situation or going to the trouble of giving the poor brutes the individual attention to which they are entitled, your position is hopeless. Sanitation, sanitation, teach it, preach it, insist upon it. It's the practitioner's only hope where carelessness prevails.

SEMI-SOLID BUTTERMILK

The value of milk as a food for animals is fully appreciated by all veterinarians. Unfortunately, it is not possible for feeders in some sections of the country to obtain whole fresh milk in sufficient quantities to supply their demands. The by-products of milk from skimming stations, creameries and cheese factories are available to a limited number of farmers but the unaltered by-products are so bulky that it is not profitable excepting for those feeders that are within hauling distance of the factories.

There is now available a special preparation of buttermilk called "Semi-solid Buttermilk" that has found favor among veterinarians and feeders. We shall be glad to have reports relative to the following:

1. Is semi-solid buttermilk relished and readily consumed by farm animals?
2. Does the product increase the amount of other feeds that farm animals will consume?
3. In your judgment, can swine and poultry be produced more economically by the use of buttermilk?
4. Is it profitable to feed this product to pigs at weaning time?
5. Have you observed whether or not it has a tendency to eliminate the ordinary round worm in swine?
6. Is there any difficulty in having the product ferment or spoil before all in a container is used?
7. Does it materially increase the time necessary in feeding of animals?
8. Have you ever observed breaking down in the back of swine that were fed on this product?
9. What do you consider normal quantities to feed to swine of different sizes, also poultry?
10. In your judgment, is semi-solid buttermilk worth while?

Pertinent fundamental information on swine parasites will be found on pages 289, 292, this issue.

Laboratory Diagnosis

Edited by C. A. ZELL, D. V. M.

DIRECTIONS FOR PACKING SPECIMENS FOR LABORATORY EXAMINATION

1. Gross anatomical lesions, where a bacteriological examination is desired, are best sent carefully wrapped in a cloth wet in a 2 to 10 per cent solution of formalin, and properly boxed. For small specimens use the weaker solution. For large specimens, the stronger solution.
2. Chickens and other fowl should have the feathers removed, be wrapped in a cloth saturated with 10 per cent formalin solution and sent to the laboratory whole and unopened.
3. Specimens of tumors or other tissue, not for bacteriological examination, may be sent in a 4 per cent formalin solution.
4. Specimens of blood, pus and body fluids for bacteriological examination or for serum tests should be drawn aseptically and sent in sterile containers (small bottles boiled and cooled), airtight. Such specimiens should reach the laboratory quickly. If sent by parcel post they should be sent special delivery. It is best to send blood, pus and body fluids by first class mail, special delivery. If the quantity of pus is small, dilute it with sterile normal salt solution to prevent drying. Sterile containers will be supplied on request.

Quantitative chemical analyses cannot be furnished free of charge owing to the large amount of work often involved, but tests for the presence of the more common poisons will be made without charge.

Where an immediate reply either by wire or letter is requested, a nominal charge will be made. In such cases, the inquirer will be billed direct by the laboratory.

In all cases where laboratory examination is requested the history and symptoms of the case as fully as they may be obtained, and a description of the post-mortem findings if an autopsy has been made must accompany the request, the object being not only to enable the laboratory technician to render the greatest service possible, but also to make the report of value to readers who have not seen the case.

Send all correspondence and specimens to Dr. C. A. Zell, Room 1611, Masonic Temple, Chicago, Ill.

BANG'S BACILLUS FOUND IN PLACENTA

The parcel I am sending you contains a piece of the placenta of a cow from a herd of 45 in which 10 have recently aborted. Please make a laboratory examination for abortion disease.—F. G. P., Ill.

Reply: The specimen not only showed the typical lesions found in abortion disease but the bacteriological examination confirmed this diagnosis by revealing typical abortion bacilli. The fibrinous purulent exudate on the cotyledons of the specimen is exceptionally characteristic. Immunization of this herd with live-culture vaccines is advisable and without delay.

TWO CALVES DIE FROM TUBERCULOSIS

I am sending you three samples of milk which please examine for B. tuberculosis. Two calves that have been drinking this milk have died from tuberculosis.

The bottles are numbered 1, 2 and 3. Numbers one and two are from suspected individuals and number three is a herd sample.—B. B. H., Ia.

Reply: The samples contained numerous streptococci and diplococci, but no B. tuberculosis were found. It will be necessary to make cultures and will require some time to determine whether or not these samples contain the organism you suspect.

The fact, however, that two calves have died from tuberculosis indicates there is something seriously wrong with this herd, and no time should be lost in locating the mischief makers by tuberculin tests.

HEMORRHAGIC SEPTICEMIA IN A FLOCK OF SHEEP

Enclosed find a specimen from a sheep, which please examine bacteriologically and send me your report as soon as possible.

This animal was found very weak upon examination and when helped up could not stand. It would throw its head upward and backward and showed pronounced nervous symptoms. The respirations were fast and labored and the temperature 102.6° F.

The autopsy revealed hepatized lungs and an intestinal mucosa that was dark colored and showed necrotic areas. There were also some caseous nodules here and there on the intestines that resembled those of caseous lymphadenitis. The intestinal tract was empty.

This was the second death in the flock. The feed is silage and grain and the water supply is from a nearby ditch. Although the autopsy indicates hemorrhagic septicemia I have suspected botulism and would like to know whether these two diseases are sometimes found together. On an adjoining farm a case that seemed similar recovered after receiving a

dose of sodium cacodylate, nux vomica and a laxative of mineral oil.—N. E. P., Ind.

Reply: The specimens of every organ you sent showed the organisms of hemorrhagic septicemia and the findings were verified by cultural experiments. The flock should be immunized with bacterins as there seems to be no question as to the correctness of your diagnosis.

COMPLEMENT FIXATION TEST SHOWS ABORTION DISEASE

The blood samples sent you are from a heifer that lost a calf a year ago from scours. At various times she has shown signs of impending abortion and abortions have occurred in the herd during the last nine months. I am requesting a laboratory test for abortion disease and a reply as soon as possible.—F. G. D., Ill.

Reply: The test gave a positive reaction, showing there are immune bodies in her blood and possibly in that of the others of this herd. We advise you to read carefully the article on immunization against abortion disease by C. H. Schultz in this issue.

GENERALIZED STREPTOCOCCIC SEPTICEMIA

The cow in question was a grade Holstein that freshened in January. She was given the intradermal test without reaction and was apparently healthy until the first of February when one night she was found bloated. She seemed to recover from this sickness but gradually became weaker and dried up. The appetite was good until two or three days before she died but she lost a great deal in flesh.

The specimens are: heart muscle; right kidney which was four times the normal size; right ovary showing surface deposits; liver and some heart's blood. At the autopsy the intestines were found empty and showed numerous ecchymoses the size of a match head. The liver was normal as to size but light in color; the spleen was enlarged and very light colored; both kidneys were abnormally large and encapsulated in a putty-like and cream colored tissue; the right lung was normal but the left was dark probably from hypostasis and was emphysematous in the parenchyma; and the heart was 33% too large and very dark.

The cow came from a tuberculous herd two years ago, where four cows reacted, two of which were condemned at the post mortem inspection.

Please make a careful examination and report your findings.—R. G. B., Ia.

Reply: We are inclined to believe, after a careful examination of your specimens that you may safely exclude tuberculosis. The cultural experiments were negative as to the tubercle organism but positive as regard to the streptococcus found in the first examination.

FIBROSARCOMA IN A MULE

I am sending you a section of a wart-like tumor ablated from the hind fetlock of a six year old mule.

A year ago, when the growth was about an inch and a half in diameter I excised it level with the skin and after the bleeding stopped dusted the area with arsenic and repeated this caustic application after the scab of the first one dropped off. These two cauterizations left a depression below the level of the surrounding skin. It has now grown to twice the original size. I have ligated the growth and extirpated the section for your examination.—J. E. S., Ohio.

Reply: The microscopic examination of the specimen proves the growth to be a fibrosarcoma, a form of malignant tumor that is not uncommon in the locomotory apparatus of solipeds. The only hope of curing this animal is in radical extirpation of the entire growth, together with as much of the surrounding healthy tissue as seems prudent. It is possible that this treatment has been delayed too long and that a recurrence will follow. In early ablation lies the only hope from the treatment of such growths. As this tumor is located amid "forbidden tissue" it is doubtful whether you will be able to reach the desired objective with safety.

Tetanus in a Goat

A Swiss milk goat upon examination disclosed trismus, stiffness in gait; otherwise no change in the general condition, incapable of taking food. History revealed that two weeks previous the animal was slightly lame. The diagnosis was partial tetanus. Treatment with tetanus antitoxin, 2,000 units. The animal made a speedy recovery.

—Ber. Tier. Woch.

The omentum is rarely mentioned in veterinary literature excepting as an anatomical structure. It is an important factor in absorption and is capable of walling off and thus circumscribing peritoneal infections. It is also important in vascularization after abdominal operations.

Abstracts of Foreign Literature

Edited by A. EICHHORN, D. V. S.

IMPOTENCE AS A RESULT OF CHRONIC PROSTATITIS IN A BULL[1]

A bull which had no inclination for breeding whatsoever disclosed upon examination that he stood with his hind legs widely spread apart and that he urinated with much less frequency and for a much longer time than other animals. He was slaughtered on account of his incapacity for breeding and a careful examination of his urino-genital apparatus was made. The testicles appeared normal, the semen contained spermatozoa of normal appearance and in sufficient numbers; the kidneys and seminal vesicles showed no deviation from normal. The urinary bladder showed a slight thickening, its mucous membrane manifesting traces of a catarrhal inflammation. The prostate was greatly enlarged, of uneven nodular surface with pea to hazel nut size protuberances. Its weight was 103 grams, 13 cm long and 7 cm broad. On incision its tissue proved very hard. The cut surface showed a slight yellowish color. The microscopical section revealed the presence of a very pronounced chronic interstitial prostatitis with atrophy of the glandular elements. The author attributes the impotence of the bull to this condition which he supports by the observations in man resulting from similar conditions.

INFECTIOUS ABORTION OF MARES AND PYOSEPTICEMIA OF COLTS[2]

The author points to the great extension of these diseases and is of the opinion that both conditions may be attributed to the same cause. The transmission occurs as a rule during the act of breeding. The disease producing organisms develop slowly in the genital passages and result sooner or later in abortion; or in case of normal birth it results in an affection of the colt. The author considers as a proof for the identity of both diseases the pathological findings of the fetal membranes in which the changes depending on the extension and intensity are an index for the severity of the disease in the young. He believes that the causative agent has not as yet been definitely established and therefore the vaccinations are of doubtful value. The so-called blood injections have also failed to give uniform results. For this reason stress should be laid upon prophylaxis and for this purpose the following recommendations are made: All mares which aborted or if their colts die within the first few days from septicemia should not be bred in that season. All owners of stallions should be advised to thoroughly disinfect and clean the penis of the stallion before every breeding act. Therefore, it should be required that stallions should cover only mares with a clean record as far as an infection of the genital organs is concerned or such which after three weeks still have a healthy colt. These precautions appear justified from the observation of mares which aborted. Such mares after a short time develop an irregular period of oestrum which results from the action of the pathological secretions on the genital organs.

AN INVISIBLE STAGE OF PATHOGENIC PROTOZOANS (PIROPLASMA ANAPLASMA, AND TRYPANOSOMES)[3]

According to Schaudinn there are developing forms of spirochetes which are so fine that they cannot be individually recognized. Schaudinn considered it possible that protozoa in this stage of development may pass Chamberland filters, and furthermore that there are stages in the life cycle of protozoa where they are entirely invisible. His theory has been confirmed by the works of Japanese and German investigators relative to the spirocheta-icterohemorrhagic. They succeeded in infecting test animals with filterates from organs of affected patients. The authors have further confirmed the correctness of Shaudinn's theory that protozoa in certain cases are present in invisible condition through their investigations with piroplasma bigeminum and anaplasma. They inoculated blood of infected cattle into sheep and goats and succeeded in reinfecting cattle with the blood of these animals without their showing any disease condition or a visible form of the transmitted parasites.

They further withdrew blood from guinea pigs and horses which were infected with trypanosoma Gambiensis equinum and surra and inoculated the same into sheep. They

could at no time demonstrate trypanosomes in the inoculated animals, but on re-inoculations of their blood into guinea pigs they obtained positive results. The investigations are continued.

INFECTIOUS ABORTION AND INFECTIOUS VAGINAL CATARRH[4]

There are great differences of opinion as to the nature and importance of the two diseases which are widely spread and frequently occur simultaneously in one and the same herd. The question as to the cause of sterility, uterine catarrh, hypertrophy and the persistence of the corpus luteum, cystic ovaries, etc., are still to be solved. The author examined several herds of cattle for the presence of both diseases with a view of obtaining data to determine to what extent both of these diseases have an influence on the disturbances on the breeding and sexual life of cattle. Based on the published observations, the officially collected data of the live stock board of Rostock and on his own very extensive investigations, he is of the opinion that in herds where both of these diseases exist simultaneously the abortions are almost without exception due to an infection with the bacillus abortus Bang. An infection with this organism, however, does not necessarily mean a case of abortion. Infectious abortion has an etiological relation to disturbances in oestrum and conception. Cows which still possess antibodies in their blood—which as a matter of fact are present there for a long time—may have normal oestrum periods and conceive normally. Infectious vaginal catarrh alone does not cause abortion. The possibility of it causing at times irregular oestrum periods or failure of conceptions is possible.

IMMUNIZATION AGAINST INFECTIOUS ABORTION[5]

For a period of five years the Imperial Board of Health conducted investigations to determine to what extent a passive or active immunization may control infectious abortion. An accurate interpretation of the results of the vaccination and the determination of the value of the various products is very difficult. Abortion in a herd may suddenly cease for various reasons. For instance, a diminished virulence of the virus may bring about a spontaneous cessation of abortions. Besides the disease running through the entire herd may also be responsible for the disappearance of the disease. Only in excluding all these possibilities can a sudden cessation of abortions be attributed to the action of vaccination. The solving of this question, therefore, requires very extensive investigations of several years. The experiments of the Imperial Board of Health involved 3,000 animals in 80 herds. Of these, 1,650 were vaccinated and 1,350 served as controls. For the vaccination they utilized living and killed abortion cultures, abortion immune serum as well as abortion cultures and immune serum. The results of the vaccination were as follows: Following the vaccination the total number of abortions diminished by 10%. In the control animals it increased by 5%. The passive immunization of pregnant animals with the abortion serum failed entirely. Non-pregnant animals with a record of one previous abortion proved protected against further abortions by the injections of living cultures. Two injections of killed cultures produced in non-infected and infected animals a protection against the natural infection which lasts for two years. Two injections with live cultures in non-infected cattle does not invariably produce a life immunity. In order, therefore, to obtain lasting results in infected herds it is necessary to continue the vaccination for several years with abortion cultures.

(See also page 277)

FOOT-AND-MOUTH DISEASE IN MAN[3]

Time and again during various outbreaks in America and the continent cases have been reported of the disease occurring in man, but in a large number of instances the disturbance in health has been so slight that the medical attendant has not been notified, and in all probability the disease is more common than is generally believed. The human subject may be infected by direct contact with affected animals, either by the transference of virulent saliva or contents of pustules to the mucous membrane of the mouth, to the conjunctiva, or through already existing wounds. More frequently, however, infection is carried by milk and its produce (cheese, whey, butter, &c.) from infected cows; and consequently human beings may be affected in areas where foot-and-mouth disease does not exist.

—A. K. Cameron, The Lancet.

1. Clinica Vet. 1921. No. 5 and 6.
2. Derl. Tier. Woch, Vol. 37, No. 40.
3. Munch. Med. Woch. No. 28. Vol. 63.
4. Arch. f. Wiss. u. Tarkt. Tier. Vol. 47.
5. Arb. A. D. Reichsgesund. 1920.

Parasitology

Edited by MAURICE C. HALL, Ph.D., D. V. M.

The Eggs and Larvae of Swine Parasites

IN a paper published in the April issue, the eggs and larvae of some dog, cat and fox parasites were discussed and figured. This paper continues the discussion of eggs and larvae in feces in the case of swine.

In view of the fact that one of the protozoan forms is very commonly present in swine feces and may be mistaken for a parasite egg, this form is briefly noted here. It is Balantidium coli, one of the ciliates. In fresh feces it may be milked or siphoned out as is so often the it will resemble the parasite as figured here (Fig. 1). In older feces it is found encysted and is then much more suggestive of a parasite egg.

Tapeworms are rarely found in swine and can not be regarded as normally parasitic in this host. The few records we have of these worms from swine indicate, for the most part,

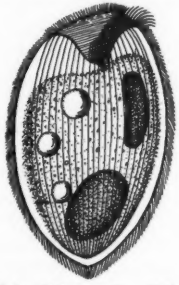


Fig. 1. *Balantidium coli.* Enlarged. From Gedoelst, 1912, after Leuckart.

that they are present as a result of the swine having eaten entrails of sheep or other animals, the swine being slaughtered shortly afterwards while the worms were yet present and undigested, or that the worms had developed in the swine but had failed to attain the normal development attained in the usual host, the worms being sterile. In view of this fact, the injunctions occasionally published by some writers, advising the feeding of pumpkin seed or other vermifuges to swine to remove tapeworms, are not well taken.

Of the flukes present in swine in this country, the common liver fluke, Fasciola hepatica, which occurs in swine, sheep and cattle, may be left for consideration in connection with the parasites of sheep, the usual hosts. The lung fluke, Paragonimus westermannii, is not uncommon in swine in some parts of the United States, including parts of Texas, Oklahoma and Louisiana. The form in swine has been called P. kellicotti, as a different species from that in man, but the Japanese writers regard the forms from man and swine as identical. The eggs are coughed up and probably swallowed, as a rule, passing out in the manure. These eggs (Fig. 2) are 78 to 96u long by 48 to 60u wide, with an operculum or lid at one end.

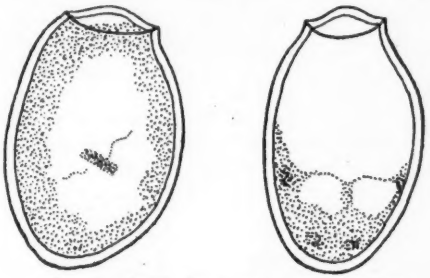


Fig. 2. *Paragonimus westermannii.* Eggs from mucus in lung. x 475. From Ward and Hirsch, 1915.

Of the nematodes of swine, probably the most important, as a rule, is the ascarid, regarded by most authorities at present as identical with the common ascarid of man, Ascaris

Fig. 3. *Ascaris lumbricoides.* Egg. Enlarged. From Leuckart, 1868.

lumbricoides, though yet discussed in many texts as A. suilla. The eggs (Fig. 3) of this worm are from 56.5 to 87.5u long by 46.5 to 57.5u wide; they are elliptical, with thick,

transparent shells surrounded by a thick layer of albumen which is irregularly mammilated and yellow, and are not segmented when deposited.

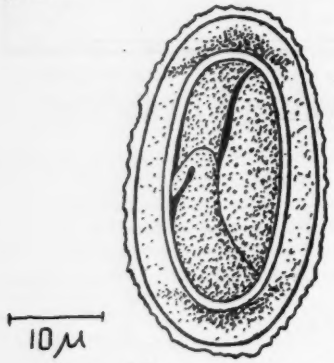


Fig. 4. *Arduenna strongylina.* Egg. From Foster, 1912.

There are two species of spirurid worms, Arduenna strongylina and Physocephalus sexalatus, which are not uncommon in the stomach of swine. The eggs of Arduenna strongylina (Fig. 4) is elliptical, 34 to 39u long by 20u wide, thick-shelled, the shell surrounded by a thin irregular membrane, and contains a well developed embryo when deposited. The egg of Physocephalus sexalatus (Fig. 5) is elliptical, 34 to 39u long by 15 to 17u wide, thick-shelled, the shell surrounded by a thin irregular membrane, and contains a well developed embryo when deposited.

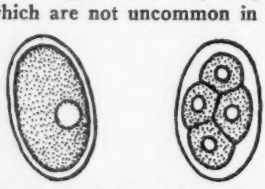


Fig. 5. *Physocephalus sexalatus.* Egg. From Foster, 1912.

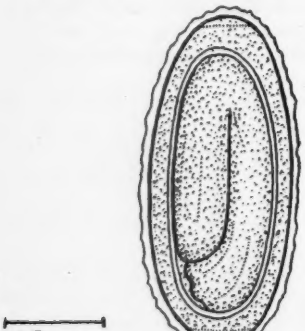


Fig. 6. *Crassiosoma urosubulatum.* Eggs. Enlarged. From Alessandrini, 1909.

The eggs of the swine whipworm, Trichuris suis, are 52 to 56u long, brown, and lemon-shaped, as in the case of other species of the genus Trichuris, such as Tr. depressiuscula, which was figured in the previous paper. In the case of a closely related and highly important worm, Trichinella spiralis, which occurs in swine, eggs and larvae are not found in the feces, as the eggs, which have a delicate vitelline membrane but no true egg shell, hatch in the maternal uterus and migrate through the tissues of the host, the parasite being transmitted by new hosts eating such infested meat and not through the medium of the feces.

Swine in this country and elsewhere are infested occasionally by a worm belonging in the group of hookworms. This swine hookworm is known as Globocephalus longemucronatus or Crassiosoma urosubulatum. The description applied to the worm under the first of these names does not appear to conform to the description given for the worm described under the second name, but the points of agreement are such that it is probable that they are identical. The eggs (Fig. 6) of this worm are elliptical and 52u long by 35 to 36u wide. In this connection it is of interest to note that the Old World hookworm of man, Ancylostoma duodenale, has been reported from swine in the Ellice Islands by O'Connor and that Legg and Reuben state that they find it relatively common in swine in Queensland, Australia. Ransom has recently reported the occurrence of three specimens of the dog and fox hookworm, Uncinaria stenocephala, from the stomach of a pig in Canada, and notes that there are specimens of Bunostomum trigonocephalum, the sheep hookworm, labeled as collected from the pig, in the collections of the Federal Bureau of Animal Industry. A new species of hookworm from swine in the Island of Trinidad has just been described by Ackert and Payne under the name of Necator suillus. The eggs are 56 to 66u long by 35 to 40u wide.

The eggs of the nodular worm of swine, Œsophagostomum denatum, are similar in shape to those of the hookworms and are 60 to 80u long by 35 to 45u long. Another nodular worm, Bourgelatia diducta, has been described from swine in Annam. The eggs are ellipsoidal, 69 to 77u long by 38 to 43u wide, and in the morula stage when deposited.

The eggs of the kidney worm of swine, Stephanurus dentatus (Fig. 7), are elliptical, 100 to 120u long by 55 to 56u wide, thin-shelled, and segmenting when deposited. These eggs pass out in the urine, but may be found in the feces as a result of mixing urine and feces.

Fig. 7. *Stephanurus dentatus.* Egg, containing embryo. Enlarged. From Taylor, 1900.

The eggs of the small red stomach worm of swine, Hyostrongylus rubidus (Strongylus rubidus) are elliptical, 45u long by 36u wide, and segmenting when deposited.

An interesting nematode of swine which has not yet been reported from the United States is Gnathostoma hispidum. The eggs (Fig. 8) are 70 to 74u long by 39 to 42u wide, the shell marked with small depressions and with a wart-like projection or plug at one pole; segmentation begins in the anterior portion of the maternal uterus.

There are two species of lungworms, belonging in the genus Metastrongylus, in swine, these being M. elongatus and M. brevivaginatus. The eggs of these worms hatch in the

Fig. 9. *Strongyloides stercoralis.* Rhabditiform larva from fresh feces. x 310. From Stephens, 1916, after Looss.

lungs and the larvae are coughed up and swallowed, as a rule, the larvae passing out in the feces. The larvae of M. elongatus are 220 to 350u long by 10u wide, clear anteriorly and granular posteriorly, and with a knob-like tail.

The larvae of these lungworms must be distinguished from those of worms of the genus Strongyloides. Members of this genus occur as parasitic females which are parthenogenetic, no males being found. The eggs passing out in the feces usually contain embryos, which soon hatch under ordinary conditions, giving rise to rhabditiform larvae. These rhabditiform larvae may then give rise to filariform larvae, capable of reinfesting host animals, or may develop to free-living adult males and females, which reproduce and give rise to

Fig. 11. *Macracanthorhynchus hirudinaceus.* Egg. Enlarged. From Travassos, 1917.

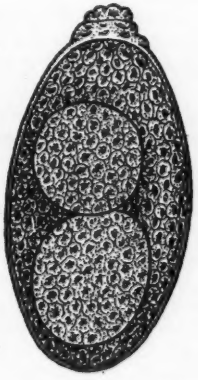


Fig. 8. *Gnathostoma hispidum.* Egg. x 700. From Ciurea, 1911.

Fig. 10. *Strongyloides stercoralis.* Mature filariform larva. x 620. From Stephens, 1916, after Looss.

rhabditiform larvae, which later develop to infective filariform larvae. One species which has been described from swine in Strongyloides suis. Another species which is reported from swine is the one found in ruminants, Str.

papillosus. Ackert and Payne have recently reported the form from man, Str. stercoralis, from swine in the Island of Trinidad. The rhabditiform larva (Fig. 9) and the filariform larva (Fig. 10) of the human Strongyloides are figured here.

The eggs (Fig. 11) of the thorny-headed worm of swine, Macracanthorhynchus hirudinaceus (Gigantorhynchus gigas) are oval, 90 to 100u long by 51 to 56u wide, and provided with 3 shells; the embryo is coiled up and has at the anterior end 4 large hooks and a number of smaller ones.

THE DOSE OF CARBON TETRACHLORIDE

Will you kindly inform me as to the proper dosage of carbon tetrachloride for dogs and cats? Is the drug very poisonous in large doses? Is it a safe treatment for pups and delicate dogs? And, is it an efficient vermifuge for horses and swine and what is the dose? Is it necessary to follow the treatment with a cathartic? Any information you can give me on the drug as a vermifuge will be appreciated.

Reply by Dr. Maurice C. Hall: The therapeutic dose of carbon tetrachloride for dogs and cats is at the rate of 0.3 cc. of the drug for every kilo (2.2 pounds) of live weight of animal. The dose for a dog of average size (22 pounds) is 3 cc. This should be given in capsules after fasting the animal overnight, without purgation of any sort before or after treatment. Care must be taken to introduce the capsules into the esophagus without breaking them, as the drug is quite dangerous if introduced into the lungs. If, by accident, any of the drug gets into the lungs, the animal will usually stiffen out and collapse or show signs of intoxication, in which case artificial respiration is sometimes of value in reviving the animal. In the digestive tract the drug appears to be unusually free from toxic or irritant effects so far as dogs are concerned, as adult dogs will tolerate, without evidence of any bad effect, extremely large doses. While it is probably true that carbon tetrachloride, like many other drugs, is less well tolerated by pups than by mature dogs, it also appears that this drug is safer than the other drugs now in use for removing hookworms, for dogs of any age.

From the few experiments which have been made on horses, it appears that carbon tetrachloride in doses of 25 or 50 cc. will remove all the ascarides and worms of the genus Strongylus from the intestines and will remove about one-fourth of the bots. It is inferior to carbon bisulphide for removing bots and to oil of chenopodium for removing the cylicostomes from the large intestine.

Carbon tetrachloride is less effective than oil of chenopodium for removing ascarids from swine. Chenopodium is quite effective when given at a dose rate equivalent to one fluid dram for an animal weighing 100 pounds, but it is necessary to use about one fluid ounce of carbon tetrachloride to secure results which appear to be somewhat less satisfactory than those obtained with chenopodium. Carbon tetrachloride is said by Doctor Peters to be effective in removing the thorny-headed worms of swine, but no experimental evidence has yet been publishd in regard to this.

I am enclosing a list of references covering the publications to date in regard to the use of carbon tetrachloride as an anthelmintic.

List of References to Carbon Tetrachlorid as an Anthelmintic

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Allen, J. A., 1922.—A treatment for hookworms in the silver black fox. Black Fox Mag., N. Y., v. 6 (2), Feb., pp. 14, 42, 1 fig.

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Hall, Maurice C., 1922.—The animal parasites of foxes, with notes on treatment and prophylaxis [Author's abstract]. Am. Fox & Fur Farmer, Utica, N. Y., v. 1 (8), Feb., pp. 12-13.

Hall, Maurice C., 1922.—The animal parasites of foxes, with notes on treatment on prophylaxis. Black Fox Mag., N. Y., v. 6 (2), Feb., pp. 3-4, 6, 36-41.

Editorial, 1922.—Carbon tetrachloride in ankylostomiasis. Lancet, Lond., (5139), v. 201, v. 1 (8), Feb. 25, p. 391.

KENTUCKY EWE DISEASE: A SUGGESTION

On page 255, May issue, you mention disease of ewes in Kentucky. Perhaps your trouble may be Oestrus ovis, described in Hutyra and Marek, Vol. 2, or perhaps Acute Diffuse Parenchymatous Hepatitis of Sheep on page 520 of the same volume may help you. —V. C. P., Wash.

Zootechnics

Edited by E. MERILLAT, M. D. V.

FILLED MILK

The harm filled milk is capable of doing to the dairy industry is comparable to the destructive influence of motor drawn vehicles on that of the horse, and although it is growing among us and is arousing the dairy interests to action, the menace is hardly recognized as such in veterinary circles.

It is important that we array ourselves with the movements against filled milk, just as we would array ourselves against any menace to animal-husbandry, for here we are attacking not only a harmful food product but one that can do an incalcuable damage to agriculture and to our profession.

Filled milk can be produced very cheaply. In fact, it is sold at wholesale as low as two and a half cents a can. It is such a good imitation of condensed milk that the retailer can turn it over for 10 to 11½ cents and thus bring staggering results to producers of honestly made milk products sold in competition.

POPULARITY OF MORGAN HORSE INCREASING IN SOUTHWEST

Because of its superiority in activity, hardiness, and stamina, the Morgan horse is increasing in popularity in the Southwest where stallions of the breed are being used to improve the saddle horses on the range. Used on the native light mares they produce a useful animal that satisfies the ranchers' demands.

As a result of the efforts of the United States Department of Agriculture in improving the Morgan and in stimulating a renewal of interest in this useful American breed, good breeding specimens are now found in many parts of the country. In order to obtain suitable remounts for the service the Army has placed Morgan stallions in Kansas, Missouri, Montana, Nebraska, and Texas. A few are owned privately in Illinois, Missouri, and Iowa, but the stronghold of the breed remains in New England, particularly in Vermont, where it was first developed.—U. S. Clip. Sheet.

The "Truth in Fabrics" bill which has been in Congress for some time, is sleeping somewhere in the archives of the Senate. Although designed to protect the consumer against shoddy and part wool clothing, and to help develop the sheep industry, there seem to be influences stronger than the agricultural bloc, which prevent it from being enacted into a law.

AGE TO BREED BITCHES

At what age is it considered advisable to breed bitches? Six to eight months is given as the age of puberty and considering that some bitches are undeveloped at that age I am quite undecided as to the proper time to begin mating. I would thank you for a reply.

Reply: Bitches like the female of any other species should not be bred too young. It is always better to wait until the second heat period. Exception might be made in the short-lived dogs such as the English bull dog which develop much more rapidly than most other breeds.

BUTTER FAT AND FEEDING

Can the fat content of milk be improved by feeding or is the matter purely one of individual quality?

Reply: The fat content depends upon the cow and very little upon the food. Perceptible increase is sometimes induced by feeding but in the end of any definite period it is always found that the average is the same.

KEEPS FEEDER PIGS AT HOME UNTIL FINISHED FOR SLAUGHTER

A co-operative live-stock shipping association in Indiana helps to keep feeder pigs at home instead of sending them to market when they are offered by members for shipment. This feature of co-operative work has been called to the attention of the United States Department of Agriculture, which thinks the idea a good one. Farmers who desire feeder pigs inform the manager of their wants, and when pigs of the feeder type are brought in on shipping day all but a few head are kept at home until finished for slaughtering. Only enough are sent to market to determine the prevailing market price. Those retained are sold to farmers desiring them at the Buffalo

market price less transportation and marketing costs, the usual costs assessed against those animals going to market.

The American food supply will, no doubt, always be sufficient to prevent starvation, but it requires more than quantity to prevent malnutrition.

Meat scraps and ground bone are an excellent food for poultry, but care should be exercised in the selection of these foods to guard against the introduction of disease.

Cabretta is a term used in several large cities to denote kid meat. There is a movement on foot to give a special name to goat meat to correspond to pork, mutton, etc. The name "goaton" has been suggested.

There are $8,000,000 invested in fox farming in the United States, over 500 fox ranches and more than 15,000 silver foxes in captivity. The industry is said to be the most promising departure of the period in animal husbandry.

Egg production can be increased by the use of artificial light and proper feeding. The most successful poultrymen provide electric or other artificial light during the winter months at 4:30 a. m. and feed just before the hens go to roost.

A hog waller even the concrete type is a nuisance on any farm. They are favorable for the harboring of parasites and various infections. Provision of shade during the summer months is more preferable than the maintenance of a hog waller. Swine are clean in their natural wild state, then why subject them to filth in domestication?

THE FUTURE OF CAVALRY

After a study of all the events of the recent war and prospecting into the needs of the future, experts from the British Army announce that cavalry is not an obsolete arm of modern military operations. In spite of such adjuncts as aeroplanes and tanks they say the day has not yet arrived when mechanical contrivances can replace the man with the rifle and the man with the horse. The campaign in Palestine is cited as an example of achievement by cavalry.

It has been estimated that there were between 18% and 25% more sows bred for spring farrowing in 1922 than in 1921.

It has been reported that the Western Texas Goat Growers are expecting a short kid crop. The extent of the expected losses is variously estimated at from 10 to 25 per cent.

Lad's Iota, a Jersey cow owned by S. J. McKee of Independence, Oregon, has been proclaimed as the champion butterfat producer of mature cows. Her record of production for one year was 1047.94 pounds of butterfat.

The Bureau of Animal Industry of the United States Department of Agriculture is "on its toes" ready for a possible outbreak of foot and mouth disease, made possible by the prevalence of the disease in Europe.

The Eastern States Tuberculosis Eradication Conference of the United States Bureau of Animal Industry will be held at Hartford, Conn., June 6, 7 and 8, 1922, under the auspices of the Connecticut State Veterinary Medical Association and Commissioner of Domestic Animals.

A high authority on dairy cow judging, whose opinion I fear to challenge, said: "The ribs should be well strung so that you can lay three fingers between them, denoting that you have a better digestive capacity." This may be entirely correct for all I know, but just what the ribs have to do with digestion is beyond me—a mere vet.—I. D. K.

As milk flows from the mammae through the influence of mechanical stimulation it is essential that milking manipulations should convey only perfectly agreeable sensations; and in order that there be no interruption to the normal functioning of these sensations, quietness must prevail in the environment. Soft pleasing music is even helpful.

Harsh, hasty milking, rough handling of the cows, and pandemonium in the surroundings are capable of decreasing the production of a single milking as much as 33%, and will eventually reduce efficiency of the best dairy herd both as regard milk production and breeding results.

Live Stock Poisoning

Edited by L. H. PAMMEL, Ph. D.

Professor of Botany, Iowa State College, Ames, Ia.

COCKLE BUR

"For the last week I have been having calls on cattle of all ages running on rye and wheat pastures on low, overflowed land having a thick growth of cockle-bur. Some of these calls have been twenty miles apart. The cattle show the first symptoms eight or ten hours after being on the pasture; staring eyes, staggering gait, frothing at the mouth, very nervous resembling strychnin poisoning, paralyzing and going down and dying in from one to four hours after the first symptoms.

"Autopsy shows congested areas in muscles under the skin, and mucous membranes of large bowels congested with small amount of blood in the bowel. The liver is dark in color, the gall bladder stretched to its limit with a light green colored fluid. The entire lungs are congested, spleen normal in size but showing slight decomposition, kidneys normal, and large quantities of cockle-bur stems in the rumen.

"I have not been able to get any results from drugs. Large doses of strychnine seems to hurry them up. Chloral hydrate did not give me any results.

"I diagnosed these cases cockle-bur poisoning and have had no further trouble when the cattle were removed from the pastures containing cockle-burs. The loss has been heavy in some herds. There has also been a heavy loss in hogs through here from this cause, one man losing twenty-five head in one night. Has anyone else had this trouble?"—C. E. W., Okla.

Reply: Nearly every spring the present writer has received letters similar to the above in regard to cocklebur poisoning. The cocklebur plant contains the substance Xanthostrumarin, a poisonous glucoside, but we do not know much about its action on animals. It is certain that the burs act injuriously in a mechanical way on hogs. From all the cases reported to me, and several of these have been reported in VETERINARY MEDICINE, no mention is made of mechanical injuries. Dr. Williams mentions the occurrence of cocklebur stems in rumen. I am inclined to think that the above cases of poisoning are not due to cocklebur, but to something more powerfully poisonous. Some veterinarians should do some experimental work with cocklebur. It is, of course, possible that this has been done and that I have overlooked it.

Comment: Dr. Kinsley has observed three deaths in Jersey calves from gastro-enteritis apparently caused by cockleburs. The losses ceased when the herd was removed from the pasture ridden with cockleburs.—Ed.

SAGE BRUSH

We are sending you under separate cover some specimens of sage which cattlemen are claiming is causing a sort of poisoning among their cows. It is very evident cattle are eating large quantities of this sage brush at this time and would like your opinion as to whether it was ever considered poisonous for this species of animal.—O. M. F., Texas.

Reply: This particular specimen is Artemisia frigida. This has been compared for me by Mr. Cratty and the species occurs from Texas to Saskatchewan in the semi-arid region of British America.

Of course it is well known that we have several species of Artemisia (wormwood) containing poisonous substances, like absinth which is a stimulent and tonic. This one also contains the well known substance absinthin, and the oil produces cerebral disorders. Santonin which is a worm remedy also comes from the species. There are certainly not many cases on record where species of Artemisia have been suspected of being poisonous. It is a well known fact that the powdered material of the native sage brush produces sneezing. I have this to say in regard to the species in my Manual of Poisonous Plants:

"Various species are suspected in Montana of being poisonous to stock, but no specific cases have been reported to the department. At Boston in May, 1900, it was noticed that the terminal branchlets of A. tridentata had all been eaten off from a considerable number of plants."

I would, therefore, say that the plant in ques-

tion is not poisonous, unless inordinate and large amounts of it are fed, and without other food.

MOLDY MIXED FEED

Am sending under separate cover samples of a mixture of feed made of oats, corn, alfalfa, salt and cane syrup. This feed has been used in this locality for some time and given good results but this sample is out of some feed that has become damaged from being wet. There were five animals (mules) that died in the course of two weeks time and in my opinion death was due to the moldy condition after becoming wet. Would like you to make examination and give report on this as soon as practical.—L. E. B., Ala.

Reply: This mixed feed is very moldy and smells musty. The same has been submitted to an examination with the following results: The corn contains a species of Fusarium in considerable quantity, also some kernels contain the common blue mold (Aspergillus glaucus). The form found here contains the perfect spores of the fungus in asci, which means that this material has been moldy for some time. There is also a brownish mold (Cladosporium) and the alfalfa contains a fungus which we have not determined. Every sample of the alfalfa is covered with this fungus. There are also numerous bacteria. It appears to me that this material is not good feed to use and I should say that feeding such material might easily cause poisoning in livestock. I wish I might impress on the farmers that such material should not be used for feed.

GOLDEN GLOW

Specimens have apparently caused auto intoxication of a herd of 18 pigs and 3 sows. The plant is only about 6 inches tall now. Enclosed are pods of last year's plant.—F. D. R., Neb.

I am sending samples of weed which has been poisoning hogs. I have been to the place every spring for the last 3 years to see hogs which were poisoned when turned into the pasture. There is a lot of wild hemp in the pasture but do not think this causes the trouble. Hogs get blind and stagger around, go into convulsions, finally getting down and become comatose. I have good luck when I treat them at the start with large doses of tannic acid. Hope to hear from you as to what this weed is.—J. A. B., Ia.

Reply: One of the plants sent to me proves to be a wild gooseberry (Ribes gracile) which could only be injurious in a mechanical way. The other plant is a perennial and is what is called golden glow (Rudbeckia laciniata) a native member of the sunflower family which is common in low grounds in Iowa. I have had a number of letters at different times in regard to the supposed poisoning from this plant. I have suspected it was poisonous. Specimens of this plant have come from Kansas, Illinois and Iowa. There can be no question but what the wild plant of hemp is poisonous. I am sure the strong odor from young hemp plants will deter hogs from eating the same. I should like to hear from others in regard to golden glow. It is easily recognized. Stem smooth, branching, 0.5-2 m. high; leaves smooth or roughish the lowest pinnate, with 5-7 cut or 3 lobed leaflets, upper leaves irregularly 3-5 parted; heads long peduncled.

I should hardly consider this plant capable of causing auto-intoxication as I understand that term. I believe, however, that it is injurious to livestock.

MILK WEED CAUSES MANY DEATHS

Stock poisoning by weeds on the western ranges is often so insidious that it is difficult to trace the cause of the trouble to its correct source. This is true of the various milkweeds, some of which have poisonous properties, while other suspected varieties have been found to be nonpoisonous.

A recent publication of the United States Department of Agriculture describes one of the most injurious of these weeds, the Mexican whorled milkweed, which is believed to have caused much of the sheep trouble attributed to some other varieties. The plant ranges from Mexico northward through California, western Nevada, and southern Washington to eastern Idaho. It is also known as the narrow leaf milkweed. Feeding tests indicate that the poisonous qualities are most pronounced in the leaves. Only sheep were used in the feeding experiments, but other investigators assert from experience that cattle also are subject to poison.—Weekly News Letter.

I have found phenol a good antidote for black cherry poisoning. It grows in abundance here (W. Va.) and if cattle eat the leaves when wilted it is deadly poison.—Schuck.

Canine, Feline and Avian Practice

Veterinary Service in the Poultry Industry*

By Professor Allen G. Phillips, Lafayette, Ind.
Professor of Poultry Husbandry, Purdue University.

WHY I have been called up here to talk about the old hen to you is more than I know except in nineteen-seven I was a sheep inspector and was called doctor. They didn't have enough veterinarians in those days and they called animal husbandmen in New Mexico and Mexico, "Doctor" and by the way, I got my eye teeth cut. The veterinary profession has been a big help to me. I have been called from Indiana to come up here and discuss this question with you and I say I don't exactly know why. It might be that once there was a rooster who flew over the fence into the neighbor's yard and brought home a big ostrich egg. He had an awful time getting it back. He got it over in the pan and called all the hens around it and said, "Now, ladies, I want you to look at this egg. I have no complaints to make but I want to show you what they are doing in other countries." That may have something to do with it because they have no poultry department in the Illinois University. Mr. Hart of Cornell University will, however, soon be put in charge of such a department on the 1st of February. He will co-operate with you and will be a big asset to you.

A Billion Dollar Industry

Now the poultry business in this country is something you ought to realize in order that the very facts discussed awhile ago concerning the use of small animals in your practice may be appreciated. I want that pretty clearly put out. I don't put the poultry business with the cat business. I don't put it with the lion or tiger or parrot or dog business. The poultry business in the United States is a billion dollar industry and last year it produced one billion dollars and more because no hens in cities were counted in making up our census.

In nineteen-ten there were over four hundred million hens. I don't want to give you a lot of statistics because a man once told me there were three kinds of lies; black, white and statistics. At the same time, I want you to get clearly the fact that the hen is a big thing, although she in herself is small. In the last ten years this industry has increased many per cent.

Phenomenal Increase

As a practitioner, a man is interested in knowing whether the business is going forward or backward. It is going forward. There are three million more hens in Indiana than there were ten years ago. In Illinois there are over five million hens. There is something for you to work on because it was said awhile ago that there are plenty of sick chickens with feathers on, outside of that I know nothing. The increase in Illinois last year aggregated sixty-seven million and more dollars.

Figures to Ponder Over

Now if I can take Indiana for an example, (and I am sorry I can't get the figures on your state because the state census report as I get it regarding agriculture is not available), I find Indiana produced fifty-two million dollars' worth of poultry, the farmers sold thirty-one million dollars' worth of that and ate twenty-one million dollars' worth. The average farmer is not apt to consider the hen particularly; if he expects his wife to pay for the groceries out of the poultry business he doesn't think how much they eat. When nearly half the poultry produced in the middle west is consumed at home that makes it look a little different. We found Illinois is the second state in the union in production of poultry and eggs. Iowa is first in production; Illinois is second; Missouri is third; Ohio is fourth; Pennsylvania is fifth; and Indiana is sixth. That puts most of the poultry industry in this corner.

Chickens Per Farm Not High

If I can take Indiana as an example I might say of all the fifty-two million dollars we produce in poultry, there are only eighty-six hens on a farm. These eighty-six hens produce only about sixty-one eggs per hen yet look at what the aggregate does. That means nearly three hundred dollars for every farm. Nearly three hundred dollars for every farm!

*Ext. Rept. Ill. S. Vet. Med. Assn., 1921.

It also means an income of over three dollars from every hen. Now that might give us just briefly the fact that the poultry industry is not an infant industry. It is worthy of every bit of thought that any phase of agriculture ought to have.

Eggs Class with Milk as a Food Essential

We all know that poultry and eggs are food essentials. You were talking awhile ago about what to feed the sick dog and the first thing mentioned was eggs. Any physician will tell you the first things many times a human needs, when an invalid, are milk and eggs and I put them both in the same class as far as food values are concerned. I will admit the oatmeal manufacturer says, "Eat one plate of our oatmeal and you can have the equivalent of one dozen eggs," or the raisin man says, "A bunch of our raisins is equal to four or five quarts of milk," but you and I know that is simply advertising. They have to go away off the subject to prove that. Poultry and eggs are on every table and if they weren't so blessed high you and I would eat more of them. That is the reason we don't. Every man, woman and child in the city of New York eats over twenty-one dozens of eggs every year. I believe out here where we get them lots cheaper we eat more. Since I get eighty-eight cents a dozen in New York, I believe we are eating them because we don't have to pay that much.

Importance Forecasted by Dean Skinner

When I went to Purdue University in nineteen-ten to organize a Poultry Department—asked Dean Skinner why in the world he had organized a Poultry Department. He said, "Phillips, as the days go by and the years roll along we are going to find that the beef industry particularly, followed by the hog industry is going to become a more precarious part of agriculture. So far as productions are concerned there is very apt to be less of it as our farms become smaller, our population increases and farming becomes more complicated. The hen must be the individual to produce food for human consumption." Any chicken man, of course, will tell you that because any chicken man believes in his industry or he wouldn't be in it and have a little stock man tell him that it must be based on something besides favoritism. We know the poultry business is economical. Besides, we know if there is anything on the farm that is profitable it is the old hen. I have had live stock men in our state tell me in the last two or three years that they had to increase the number of hens to hold them over when live stock wasn't paying. For a beef cattle man to admit the hen is the main thing is the biggest victory we want.

Men Are Replacing the Women

Regarding extension work: eleven years ago it was largely women who raised chickens. I think you will admit that a woman is harder to put a business proposition before than a man. She can't understand because that isn't her forte, she can understand domestic problems better. I am not speaking in any uncomplimentary way at all. The poultry business on a farm must be as much a man's business as it is a woman's. When we get it on a dignified basis it will be a good business because a man doesn't like to see anything die and if it belongs to the woman and dies he doesn't care.

Fits Into Agriculture

The hen business fits into agriculture. It isn't the most important part of agriculture but its fits in as a part of it. Every farm in Illinois ought to have two hundred hens and every farm with two hundred hens would bring the farmer seven to eight thousand dollars income. How much that profit is, is dangerous for me to suggest. Of course, profit depends on the man in the business more than it does on the business. Some people say, "Is the poultry business profitable?" It all depends on you and where it is. I think that is true of every line of business we have.

Disease of Poultry

Now your Secretary asked me to talk a little about the diseases of poultry. You will have to pardon me as I am not a veterinarian, I am not particularly trained along the line of diseases but I do know there are some things I have come in contact with, some things I have learned, at least the high spots. I know most of you when you went to veterinary college did not have an opportunity to study poultry. I think I can give you a few hunches that may help you to meet certain situations.

The Factor of Malnutrition

The first thing you have to give consideration is the managerial end of the poultry business because malnutrition, in my estimate, is as big a cause of loss as are infectious diseases among poultry. It has been mentioned today a dozen times. I enjoyed hearing you speak of the jack and that management was as big a problem there or the biggest thing that

(Continued on Page 342)

HOG SERUM FOR DOG DISTEMPER

Case No. 1

I have had a bitch affected with distemper that had been given as much red iodide of mercury as would lay on the point of a small knife blade, repeated every two days. This treatment was thought to be a cure for distemper by the dog fancier and sportsman who owned him and who said he had cured many cases and had known that others have also been successful with this treatment. As an adjuvant to this treatment the county farm adviser was called in on account of the reputation he had made with the use of the hypodermic syringe. As there was a bottle of hog cholera serum handy, he gave the dog a dose of 20 minums with instructions to repeat the dose in two days, if the dog was living. In the meantime I was called and my advice solicited. I stopped the mercury and also the serum and wrote a prescription for the general tonic to be preceded with castor oil.

The dog had been quite sick from what they told me and at this time had some fever, and the breathing was very labored, but strange to say, the dog had never lost his appetite.

I am not trying to be severe in my criticism, but this treatment is indeed a new one for distemper as far as I am concerned. Have you ever heard of this new therapy?—B. E. C., La.

Case No. 2

I have just had a client in my office settling a bill for a dead setter, nine months old, who told me about an article he read in the American Field about a veterinarian who has cured 128 cases of dog distemper with hog cholera serum, losing only two cases. Will you please give me your opinion about this treatment?—G. R. S., Wash.

Case No. 3

For canine distemper, have you ever tried making a subcutaneous injection of clarified hog cholera serum in doses prorated as if for hogs of similar weights? Do not say it will kill the dog or is not scientific. Make the injection, collect your fee and send a cured dog home. This is more economical than the canine distemper vaccines and gives just as good results.—G. E. E., Miss.

Reply: Several letters have come to this office recently announcing the remarkable results obtained in the treatment of canine distemper with hog cholera serum, each one announcing the marvelous results they are having with this unusual serotherapy, and as a consequence we publish these queries simply to indicate that the treatment is attracting some attention outside the profession. A clipping from Field and Stream (December, 1918) published in VETERINARY MEDICINE in June, 1919, refers to the benefits of the hog-serum treatment, and an interview with Dr. Chas. Crowe, veterinarian for the American Field, brings out the fact that hog-serum has been used some among dog fanciers because blood serum has proved helpful in the treatment of this disease. Hog cholera serum is selected because it is blood serum and not for specific effect.

OTITIS EXTERNA IN A DOG

I have under my care a Chesapeake Bay spaniel 12 years old that is affected with canker of the ear. I have been using Dr. Saunder's treatment recommended in his "Canine Medicine and Surgery," for about four weeks without success. A hint as to what I should do for this disorder will be appreciated.—A. C. K., N. D.

Reply: The canal should first be well saturated with ether to dissolve the cerumen and desicated discharges, trim all the hairs that can be reached with the scissors, and then fill the cavity with a warm 2% solution of novocain to take care of the pain of the subsequent treatment and prevent shaking out of the pledgets of cotton. We then irrigate the canal well with a 3% solution of zinc sulphate and dust it well with boric acid to which iodoform may be added where there is no objection to the odor. Pledgets of cotton are very useful to take up the discharges when these are not thrown out by shaking the head. A treatment of this kind twice a day for a few days and then daily for two weeks will generally bring good returns in the acute cases. The chronic case especially in old dogs will require cauterization with a pencil of silver nitrate preparatory to the above treatment.

HYDROPHOBIA ERADICATION

As I am writing a paper for a health movement program to be given by the local board of health, on the subject of hydrophobia I would like information about any plan that might be promulgated to the end of making rabies as rare as it once was in England. Any suggestions you can give me will be appreciated.—Anon.

Reply: Rabies was eradicated from England by the simple process of not admitting any alien dogs into its boundaries except after a

long period of quarantine. It recurred there during the war through smuggling dogs over by soldiers and aviators during the war.

Eichhorn has recently made the statement that since the "virus" of rabies is so purely parasitic, preventive vaccination of all dogs once a year for two consecutive years would banish it from the earth for all time.

THE CAT

The cat is a living witness of the progress of mankind; of settled life; of civilization; but not of subjugation, submitting to man only so far as it feels like doing so. The cat does not place itself unreservedly at man's disposal. It has never, like other domestic animals, allowed itself to sink into contented slavery, and as a consequence, mankind invariably associates the cat with women. In fact everyone connects cats with femininity. Even in mythology, the cats belonged to the goddesses. Frega rode a chariot drawn by cats and other goddesses were attended by maids that rode on cats. Bart, the Egyptian Venus, was catheaded. In Egyptian history the cat is a household pet; in China, it has been used through all the ages by the housewives to tell the time of day by the size of its pupils; in legend, it is sacred to St. Martha, St. Gertrude, and the spinster. Sullivan and Balzac refer to the cat as revealing the presence of woman about the place; in fables men have changed cats into women, and it is quite natural for women to dote on them, while men are prone to do the opposite.

MANGE CURES FAIL

Would you please outline the best treatment for a practitioner to adopts for mange in dogs? My canine practice is not large enough to keep me "on my toes" on every detail and the information in the books I have and the journals I read is very conflicting, and does not seem to help me out.—J. J. L., Ore.

Reply: Mange due to acaridan parasites should never be difficult to cure. Your treatment probably fails because it lacks attention to details in regards to the preparation of the skin for the reception of the parasiticide you select. Proper preparation consists of such clipping, scrubbing and dislodging and dissolving of encrustation as the case requires. Acaridan parasites that do not actually burrow into the skin are often sheltered by filth and scabs. The cleaning up process brings them out where the parasiticide can destroy them. Then, since eggs are not destroyed by ordinary agents a second and third application is required to kill them when they have hatched and grown toward harmful maturity. It is, however, not possible to set the intervals of treatment because the incubation period is not known. There is a belief that eggs either sojourn in the skin for long periods or else the incubation is a varied one.

If an aqueous solution is used as the parasiticide it should be applied hot, because it has been shown that hot solutions are from 20 to 40 times more destructive than cold ones. If an unctuous mixture is preferred we recommend: flowers of sulphur, tincture of iodin, oil of tar and olive oil in the proportion of 1,1,8,8, respectively.

BOARD STANDINGS FOR CHICKS

Why is it that chicks do so badly when raised on a board floor? No matter how clean the place is kept all my efforts to raise a small brood fail.—J. W. W., Ill.

Reply: It is a well known fact that chickens can not be raised off the ground and that all attempts at poultry raising that ignore this fact go wrong. Poultrymen and every housewife in the country knows this and every amateur soon finds it out. Even when abundant grit is allowed and greens are included with the ration the chick on boards develop leg weakness, sicken with other complaints and begin dying.

The cause is probably due to the fact that chickens require the exercise they get by scratching for normal development and also that obtained by roaming about in the open. Close confinement is also harmful from the facts that the standings become soiled and infected from the excrement and that the variety of things the chicks is continually picking up from the ground is a balance of food requirement that can not be duplicated artificially.

Several years ago bacteriologists at Louvain University announced to the poultry raisers of Belgium that all efforts to control the serious scourges they were asked to investigate would fail as long as it was attempted to raise 10,000 chickens on a single acre of land. Chickens require space to roam upon that is large enough to be kept within the bounds of safety through the disinfecting influences of the elements, sunshine, rain, frost, etc.

Gapes is essentially a disease of young chicks and turkeys. It is manifested by sneezing, gaping, strangling, asphyxia and death.

TYPICAL FOWL CHOLERA

I am mailing to you by parcel post special delivery, a pathological specimen from a fowl.

History. This fowl was one of a flock of 300 chickens kept on a farm and allowed free range. Water supply pure. Feed which consisted of whole wheat and shelled corn was of fair quality, although I noted some of the corn was somewhat mouldy. Yards and houses were not in best of sanitary conditions; no infectious or contagious disease on this farm for the last two years. Three years ago they had chicken cholera on these premises. Birds all roost in hen houses, nothing affected but adult birds. One case of bumble foot noted on premises, no other disease except the one in question at this time.

First outbreaks noticed about two weeks ago when two birds sickened and died, no more trouble for eight days when eight died in one night. Total loss at present about twenty. Roosters seem to linger longer than the hens usually die in 48 hours; find some dead under the roosts and on the nests which have no symptoms whatever.

Symptoms. Diarrhoea, greenish in color, and watery in consistency, in the roosters. The comb and wattles become purple or cyanotic after they are affected for four or five days, usually find them dead lying on the sternum with head deviated to one side, legs out behind them, no high temperatures; a few elevated a degree or two, pulse and respiration normal. Birds in fine condition physically.

Lesions. A few small sharply circumscribed petechia on heart, a few nematodes in the caeca. The liver very large and decidedly green in color, air sacs normal.

Treatment. This was advised until I could hear from the laboratory. Make all buildings and yards sanitary by the application of lime and liquor cresolis compound. Change diet entirely to one of scratch feed and a mash of bran and middlings, use intestinal antiseptics. Isolate sick birds.

I would like a report on your findings as soon as possible.—M. J. J., Ohio.

Reply by Dr. Kinsley: Your description is quite typical of fowl cholera. The history of the outbreak, symptoms and lesions characterize the usual outbreak of fowl cholera.

The specimens were carefully examined and a bipolar microorganism, which in our judgment is the B. avisepticus, was demonstrated. From the examination of the specimens both gross and microscopic coupled with the history, symptoms and lesions, it seems that the fowls are affected with hemorrhagic septicemia or fowl cholera.

As to treatment, the suggestions of the isolation of diseased birds, proper disposal of the dead, the constant cleaning of the houses and the use of intestinal antiseptics you have recommended should be continued. The value of hemorrhagic septicemia bacterin (avian) has been demonstrated by practitioners in various sections of the country and should be used promptly in such outbreaks.

SKIM MILK AND GREEN FEEDS WILL SAVE BABY CHICKS

By the use of skimmilk or buttermilk and an abundance of green feed, many of the troubles affecting young chicks may be prevented, according to D. C. Kennard, poultryman at the Ohio Experiment Station.

Giving the chicks a good ration with all the skimmilk or buttermilk they will drink during the first six or eight weeks is regarded to be the most effective treatment for white diarrhea.

The feeding of skimmilk or buttermilk is also a good treatment for coccidiosis, a highly-contagious disease, which may break out when the chicks are from four to eight weeks of age. With this disease the chicks usually become droopy and listless.

For leg weakness an abundance of finely-cut succulent green feed with plenty of exercise is helpful.

Intestinal worms, which are responsible for many immature and inferior pullets in the flock, may be eradicated by feeding two pounds of tobacco dust in each 100 pounds of dry mash. The medicated mash is fed for four weeks.

Sodium fluorid is one of the most effective remedies to destroy lice on poultry. One pound of this product is sufficient to treat 100 fowls. It is a powder and should be applied among the feathers. Care should be exercised to prevent inhalation of the dust as it is extremely irritating.

Chicks should be fed very sparingly until they are one week of age for they absorb the egg yolk before hatching, this being natures method of providing food that will prevent digestive disturbances until the chicks become accustomed to the usual foods.

SAYS THYROID EXTRACT SPECIFIC FOR CHOREA IN DOGS

I think I have found a specific for chorea following dog distemper. While treating a horse with thyroid extract, affected with chorea that followed influenza, with apparent success a neighbor asked me to treat a bitch affected with the same disease following an attack of distemper. I prescribed three grains four times a day, stopping all other medicine, and put her a ration of milk and eggs. In ten days the jerking had stopped and there has been no return of the symptoms. The thyroid extract cured her without doubt, as since that time I have had occasion to use the treatment on other cases with equally good results. The maximum dose for full grown dogs is from three to six grains according to body weight.

Mayfield, Ky. C. A. Washburn.

PANTING IN DOGS; A REPLY

In your April issue under the title "Panting in Dogs," page 196, you describe a case which from the symptoms given I believe is affected with a rupture of the diaphragm. I would appreciate a report on the postmortem findings from the writer of this query.—J. W. H., Pa.

ANESTHETISING A MONKEY

A tiny species of squirrel monkey was recently brought to me in order that I should amputate most of its tail. The owner complained that sores were constantly in evidence on various parts of the tail, which, on account of the monkey's wilful and persistent interference, never healed, in spite of all treatment.

The little animal could lie easily within the palm of my hand, and I was in some doubt as to the probable effect upon it of a general anaesthetic. I decided to administer A. C. E. mixture.

To avoid unnecessary handling or restraint, I sought to administer the vapour whilst the monkey slept. Hobday's second pattern of inhaler was employed (minus the mask), and the sudden delivery tube passed through the bars of the cage into close proximity with the nostrils. The vapour having been pumped through for ten minutes, without anything happening, I touched the nose with the tube; the monkey thereupon looked up sleepily, gazed at the tube, pushed it away with its hand, and then went to sleep again. I continued pumping for another five minutes without result, then changed the A. C. E. mixture for chloroform. After its administration for five minutes, the animal began to grab the tube for support, and was obviously losing its balance. I found then that I could handle the little fellow without resistance, so removed him to the operating table, where he was laid upon a blanket and completely anaesthetised after three or four more minutes.

I assumed that the long time required to bring about unconsciousness was due to the large proportion of air inhaled, and not to any idiosyncrasy on the part of the monkey.

The operation was performed under strict asepsis, the excision being made through a joint, and the skin brought over the stump and sutured. The wound was painted with orthoform in collodion, and a bandage applied. Consciousness was regained almost at once, and the old attitude of sleep was shortly afterwards resumed as though nothing had happened.

—Capt. Hamilton Kirk, Vet. Record.

Our mail is full of reports on the curative value of hog cholera serum for canine distemper. Dr. Chas. Crowe, veterinary adviser for the American Field, says there is merit in blood serum for this disease and that hog serum is probably as good as any other.

Dr. C. H. Herron, one of the leading canine specialists of Chicago, says that cod liver oil is the best treatment for canine distemper. It is used both as the only food and the only medication of the affected subject.

Kerosene that has been left to evaporate a few days in an open vessel is said to be a specific for mange in dogs. An exponent of this treatment insists that one application will cure any case of acaridan infestation and several applications will cure the follicular form.

According to reports, Rhododendron (Great Laurel) is poisonous to goats unless considerable other forage is simultaneously consumed.

Some infections of fowls may be transmitted by the drinking water and it is therefore advisable to provide well protected sanitary vessels so arranged that the fowls cannot get their feet into them.

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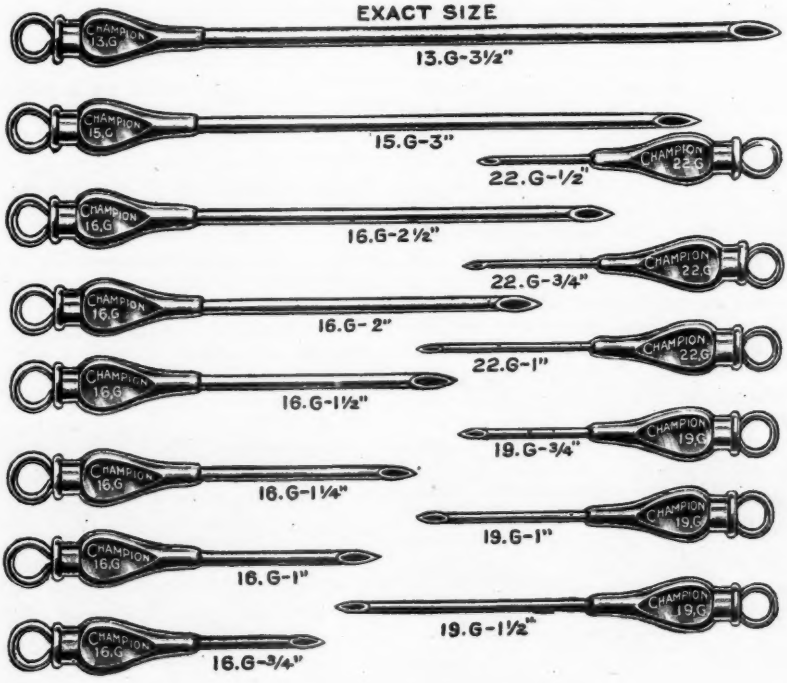

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Queries and Answers

WANTS TRUTH ABOUT BACTERINS

To arrive at a definite line of treatment for various diseases is, indeed, difficult for a recent graduate. A few days ago I had a full blooded horse step on a nail which penetrated between the frog and the bar and deep into the digital cushion. When examined some days later I found a temperature of 106 degrees F., rapid pulse, and the leg swollen to the body, although not very large. The appetite was good. I opened the wound thoroughly, washed it out with lysol and tincture of iodin, and ordered a daily irrigation with iodin. I thought the high temperature and swelling would take care of themselves after the wound got drainage. The horse died in 48 hours. Steffen says: "Give me mixed bacterins or anti-streptococcic serum, iodin, nux vomica or strychnin, and a lance, and I am ready to do battle with any case of septicemia from wound infection." Do you think that if I had used febrifuges, bacterins and stimulants I might have saved the life of the animal?

Hundreds of practitioners claim good results from the use of serums, vaccines and bacterins, while others claim no results. Why the difference of opinion? If biologics are specific, every practitioner and veterinary school would have found it out long ago. If they are of no value, why continue to extract money from the stock raiser's pocket if we can do him no good? I should like to learn the opinion of every practitioner who is reading the Journal about his experience with the use of various biologics.—O. W. J., Wash.

Reply: Bacterin, like any other line of treatment for disease, is not 100 per cent perfect. The highest degree of efficacy is, however, reached when the diagnosis is correct and a reliable bacterin is used and given in sufficient dosage. In no case must wonders be expected of them. The horse described above that died after so brief an illness from a wound was affected with an infection of such high virulence that nothing short of amputation or radical extirpation of the hot-bed would have cut short the rapid march of the process. Bacterin treatment is generally useless against such cases.

It is likely that if this horse had been submitted to the classical resection of the plantar aponeurosis its life might have been saved. The only cases of this kind which do not yield to this operation are those due to virulent anarobic organisms such as the bacillus of malignant edema.

Practitioners who depend upon bacterins alone to cure wound diseases can never hope to have the same success as those who use them as adjuncts to properly executed surgical procedure. No medical agents would have saved your patient.

A FATAL COLIC IN A MULE

A mule recently shipped from the North showed the following symptoms: Lying down frequently, rolling about and then before getting up would sit on its haunches dog-fashion. When standing it would stretch out as if to urinate, indicating impaction in the small intestines. The temperature was 104° Fahr. and it had not eaten anything for a week and only worked one day on a grader.

I administered one grain each of eserine sulphate and lobilin sulphate, a quart of linseed oil, one ounce of oil of turpentine and four ounces of ether. The mule died. What should I have done or what was left undone?

Also outline a treatment for stomach engorgement. When is salicylic acid indicated? I have had some bad results with it, and have become afraid to use it. G. E. E., Miss.

Reply: The mule died from intestinal obstruction, probably at one of the flexures of the large colon. The dog-fashion posture in colics is almost pathognomonic of such a state. The hypodermic injection you gave did much more harm than good and should have been omitted. Such cases must sink or swim on oil and intestinal stimulants. Washing out the stomach might also have done a great deal of good by overflow of the water into the intestinal tract.

There is only one treatment for engorgement of the stomach and that is removing the contents by washing it out with the stomach tube. In a few minutes a horse so affected can be completely cured. The value of salicylic acid

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5. Have calves born in cleaned and disinfected stalls.
6. Inject with BOVINE ABORTION SEROBACTERIN
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   Susceptible pregnant cows.
7. Inject with BOVINE ABORTION SEROVACCINE
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   All nonpregnant animals, including virgin heifers.
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in such cases is not very great. In fact, it should not be depended upon for the reason it is not an evacuant.

FLY REPELLENTS

Every summer I am requested to supply my clients with information of fly repellents, especially later in the summer when the flies are numerous and animals are being prepared for the fall shows and fairs. I would like best a preparation that will not stain or mar the appearance of the animals.—I. C. B., Ia.

Reply by Dr. Quitman: Here are a number of very good fly mixtures you can make up yourself. Some of them may have objectionable features but you can select the one that best suits your purpose:

Fish Oil	100 parts
Oil of Tar	50 parts
Crude Carbolic Acid	1 part
Oil of Tar	½ gallon
Cotton Seed Oil	½ gallon
Naphthalin Powder	4 ounces
Crude Carbolic Acid	½ pint

Both of these are in Bulletin No. 267, of the Ohio Experiment Station, and are recommended by the men in charge.

Comment: While these are undoubtedly efficacious as shoo-flies or fly repellents, on account of the oil of tar they are apt to stain the white coated animal, and to a certain extent "gum up" the hair. Especially number two, containing the cotton seed oil. For this, we would suggest substitution with either fish oil, which of itself has fly repellent properties, or with lard oil, which will not gum.

Common Laundry Soap	1 pound
Crude Petroleum (or fuel oil)	1 gallon
Water	4 gallons

Directions: Shave and boil the soap in the water, stirring until thoroughly dissolved. Dissolve the naphthalin in the crude oil or in the fuel oil, whichever may be used. Mix the two solutions. This was taken from the bulletin of the Utah Agricultural College and is highly recommended.

Comment: This fly repellent is liable to stain light colored hair, and separates upon standing, which however, could be overcome by aggitation. It is possible that the use of more soap would overcome the tendency to separate.

"Fuel oil" used alone is superior to crude oil, as the former does not burn or irritate

the skin, as does the latter. Fuel oil may be applied by means of a spray gun or by means of a sponge or cloth. Its application once daily is usually sufficient.—Recommended by Dr. S. P. Reagan of Oklahoma.

Powdered Naphthalin ..... 1 ounce
Lard Oil ..... 1 pint

Mix and apply with a sponge, cloth or wad or oakum.

Comment: This is easy to make, does not stain nor gum, and will wipe off easily, leaving the skin clean and the coat glossy.

Naphthalin, powdered ..... 4 ounces
Kerosene ..... 1 pint
Soap .....¼ to ½ pound
Water ..... 1 gallon

Directions: Dissolve the naphthalin in the kerosene. Shave and dissolve the soap in boiling water. Let cool and add the kerosene and naphthalin solution. This is stainless and will not gum up the coat. It may be used in a spray gun or otherwise applied.

Comment: The present author is responsible for fly repellents number 5 and number 6.

As a fly exterminator, for stables, you might try the following:

Molasses ..... 20 parts
Water ..... 80 parts

Add 40 parts of arsenic; in making this mixture, the arsenic should best be stirred for about twenty to thirty minutes in the water while it is boiling, which will dissolve a considerable portion of the arsenic. Then it may be allowed to partly cool and the molasses added.

For use, one quart of the above mixture is added to fifty gallons of warm water, and well stirred before using. This diluted solution may be sprayed on cement floors or placed in pans around the stable. Such pans or containers should be so protected that dogs, cats, poultry and other animals cannot get to the fluid.

Comment: This is a very effective fly exterminator, especially useful in stables which are protected by screens.—Contributed by G. G Blank, Allentown, Pa.

PURPURA HEMORRHAGICA

A mare developed an edema along the ventral surface of the abdomen without attracting much attention until it advanced to the breast, when I was called and found the appetite good, the pulse 48 and the temperature 102° F., and the swelling descending the fore legs. There was a muco-purulent discharge from one nostril which I thought could be attributed to a

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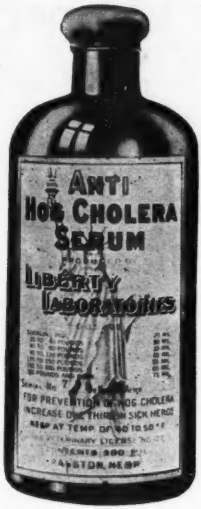

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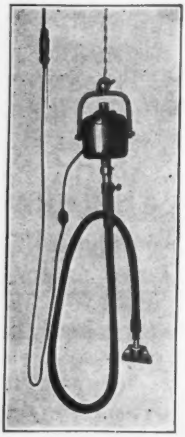

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decayed fourth molar. There was a slight edema on the nose that stopped abruptly at the nose-band of the halter. There were swellings around the precrural lymph node and a chain of swellings running under the mane from the poll to the withers and other edematous areas at different parts of the body.—J. A. B., Ia.

Reply: Atypical cases of purpura hemorrhagica are sometimes seen in horses. We recall cases of this character which developed without any preexisting febrile disease, and invariably each of them could be traced to a focal infection. In this case the trouble may have been caused by the decayed molar. Quinin, potassium chlorid, turpentine and antistreptococcic serum is the line of treatment we would recommend.

DECAYED FOURTH SUPERIOR MOLAR OF A HORSE

A four year old horse has an enlargement just over the fourth superior molar on the left side of the head. The enlargement recedes and then becomes quite large again. It has behaved in this manner several times during the last six months.

There is no nasal discharge, no suppuration and no pain manifested while eating. Any suggestion will be appreciated.—W. L. B., Wis.

Reply: Horses showing the symptoms you describe invariably have a decayed molar, although it is not always easy to confirm this fact by an examination of the tooth itself. On the other hand, if such a patient can be put in a recumbent position, the mouth opened widely with a speculum and the suspected tooth given a very thorough examination with a sharp steel pick the incriminating opening on the table of the tooth can generally be found. It may be as small as a pin point or it may be large enough to admit a probe. We advise you to go to this trouble if a diagnosis is important.

If it were possible for you to extract the tooth the horse would be cured without any further treatment but if the extraction is difficult for you to do, it will be necessary to drive it out after trephining.

It is advisable to attempt the extraction while the horse is in the recumbent position, and to use a separating forcep to help loosen it before using the extractor. By working faithfully over such a tooth, alternately using the separating forcep and the extractor to loosen it, it can usually be extracted with suc-

cess. It is always important to loosen the tooth well before attempting to lift it out. In fact, it is pretty safe to assume that a tooth that cannot be loosened cannot be extracted without fracture. The successful extraction of a molar tooth of the horse is a long, drawn-out, process, requiring patience and good judgment and much less actual force than is usually supposed, but in the end it always pays because the ugly difficulties and complications of trephining are thus avoided.

TRANSFUSIONS OF BLOOD AND NORMAL SALT SOLUTIONS IN VETERINARY PRACTICE

1. Is blood transfusion in veterinary practice practical and to what extent is it practiced in ordinary country practices?

2. In lieu of rectal injections or peritoneal injections of normal salt solutions why not pump into the stomach with the stomach tube as much normal salt solution as it is safe to pump in without injury to the stomach and intestines, and how much would be safe to pump in?—O. W. J.

Reply: Blood transfusion is not practiced as a routine measure in veterinary practice despite the fact that it is feasible and exceeding effectual therapy. Direct transfusion from donor to patient is probably not a practical operation for a field veterinarian to undertake, but the intravenous injections of citrated blood taken from a convenient donor is a practical operation and one that should become a part of our therapy. Citrate of sodium 2%, one part and freshly drawn blood nine parts is the combination to use. Blood may be drawn directly from the jugular of the donor into a large Leur syringe already containing the citrate solution and then after shaking the mixture a little it is delivered immediately into the jugular of the recipient—the patient.

Physiological salt solutions are helpful but less so than blood when it is necessary to add to the volume of blood of a patient. These can be given, in the loose subcutaneous spaces of the shoulder and stifle, in the peritoneal cavity, in the jugular or in the rectum. These we name in the order of practicability.

TREATMENT OF MASTITIS

Open the teat with the teat slitter and inject Germisol (nocte manque) and give per os 10 ounces of Bovolax (Betz) every second day and ½ ounce of hyposulphite of soda daily. I also have good success with etherization of the udder.—J. A. S.

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Looking Backward

A look into the past unfetters the mind, gives a clearer conception of the present, and tends to strengthen our confidence in the future.

"Where two people died fifty years ago out of every thousand, only one died during 1920." —Report Health Dept., N. Y. C.

The Babcock method of determining the fat content of milk was invented in 1890.

The first bacterial count of market milk was made by Sedgwick and Batchelder in 1892.

In 1892 Theobald Smith isolated and identified the bacillus of bovine tuberculosis and determined the degree of heat that will destroy it.

The production of certified milk was first conceived by Coit of New York, but none was actually produced as a market commodity until 1900-1901, when a medical milk commission was established in New York City.

The significance of sex control was appreciated already by the ancients. Pliny (50 A. D.) a writer of natural history, states in his works that if a bull after covering comes to the ground on the right side a male results, and if on the left, a female.

Galen (131-201 A. D.) recognized the importance of milk inspection. Having prescribed ass's milk for a patient he directed that the ass from which the milk was to be obtained should be inspected as to its general health.—Early Hist. Vet. Med. by F. Smith.

The first ice cream was made by Gunton. a London confectioner, but the method of freezing was unsatisfactory.

Mrs. Nancy Johnson, the wife of an American naval officer, invented the modern ice cream freezer. It is said that the first ice cream served in America was at a White House reception during President Madison's administration. From this departure Americans have developed an appetite for this confection that craves for 300,000,000 gallons a year.

Small-pox vaccination as practiced by Edward Jenner in 1796 was not an empirical procedure (an accident) as is generally supposed, but a carefully worked-out theory preconized from Benjamin Tresty, a Gloucestershire farmer in 1774, who vaccinated his family with cow-pox to prevent them from being pock-marked like the other victims of the disease.

In January, 1890, the editor of the American Veterinary Review was certain that legislation favorable to the army veterinarians would pass the Congress then in session. Twenty-four years, however, elapsed before any favorable action was taken despite the fact that the Spanish-American War showed up the shameful shortcomings of the service. After more than thirty years and a great war had elapsed into history, the much desired veterinary corps became a reality.

THE FIRST VETERINARY BOOK

The first work known that was devoted entirely to veterinary medicine was written by Publius Vegetius Renatus* (450-500 A. D.). It was published by Basle in 1528 and is believed to be the first veterinary book printed. The manuscript from which the book was printed is the first one known in which the word "veterinary" was used. The book refers to the remarkable fact that the treatment of animals has always been regarded as a low occupation and beneath the dignity of the educated mind, but Vegetius attempts to set things right by pointing out that knowledge is never mean, low, nor contemptible and there can be no shame in practising a profession that can save the state from loss. The ground covered is a vast one and conveys the impression of having been written by a profound student. It deals with classification of disease, the fallacy of charms and superstitions, good hygiene, treatment of colics by tapping, exercise and nitre for founder, fistula of the withers, poll evil, oaken distemper (tetanus), ulceration of the lungs in oxen (bovine tuberculosis), blood in the urine (azoturia), the benefits of quarantine, and a wealth of other material that shows the broadness of his observations, studies and teachings.

*Early Hist. Vet. Med., by F. Smith.

A. T. Kinsley, M.Sc., D.V.S.
Ashe Lockhart, B.Sc., D.V.M.

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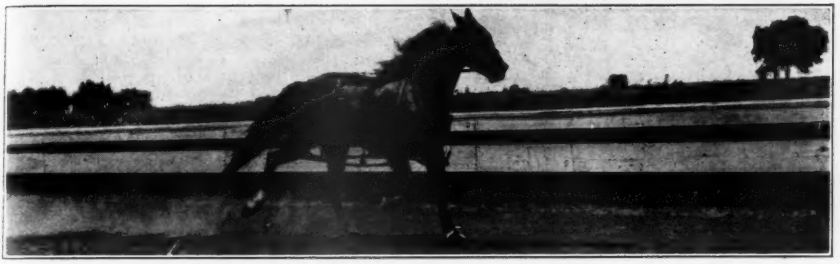

A Marvel of Equine Speed and Intelligence: the World's Renowned Driverless Wonder, Falfine 2:19¼, Owned by Dr. W. F. Brownlee, Kirkwood, Ill.

ETIOLOGY OF FISTULOUS WITHERS AND POLL EVIL

By W. R. Davis, M. R. C. V. S., Enfield

Traumatisms of some kind—wounds, bruises, bites, blows, pressure of harness, etc.—are universally taught and held to be the cause of the above-named maladies. In a fairly long experience I cannot recollect to have traced directly either of these conditions to the causes assigned, yet I have seen really dreadful cases of sore back, and severe sitfasts of old standing, which recovered without developing into fistulous withers. One case I recall was a donkey, used for giving rides to visitors on the sea shore. When I examined it the unfortunate creature had a suppurating wound on the side of the withers, and from it, back as far as the lumbar region, the subcutis was replaced by a thick layer of yellow pus. It did not give rise to fistulous withers. A curious observation I have made is that horses used continuously in town work are seldom affected. I have had contracts for twenty years with two firms owning over one hundred and twenty horses between them, and I have never had a case of either malady among the horses. However, about eighteen months ago one of the firms bought a farm and sent some of their heavy horses to work on it. Six months afterwards one of these animals—a mare, fourteen years old, developed a very severe poll-evil. I should say that a hundred agricultural horses are affected for every one used constantly in town work—and never turned out to grass. I recently asked the manager of a large firm who have depots all over North London whether their horses were often affected by these diseases, and he told me that the only case he could remember was that of a young horse that had poll-evil three weeks after purchase (the horse was probably bought with it, as the seller took the animal back).

A curious thing to remark is that many cases may be met with in one area of a practice and few in other parts of it. On eight farms, almost touching each other in my practice, I have met with the following examples of these diseases:—Farm A, fistulous withers; B, one case of fistulous withers and one case of poll-evil; C, fistulous withers; D, fistulous withers; E, three cases of fistulous withers; F, fistulous withers, followed by poll-evil in the same horse; G, fistulous withers; H, poll-evil.

The farms are small, and I do not think the horse population on them reached beyond fifty.

The late Mr. G. Upton, M. R. C. V. S., the news of whose tragic end came as a painful shock to many of us, used occasionally to permit himself some extravagances when discussing questions of pathology, but he made a remark at a meeting of the Central Veterinary Society which, though it was received with incredulity at the time, had, I venture to think, a basis of truth in it. Mr. Upton said that he regarded fistulous withers and poll-

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evil as being allied to glanders and tuberculosis, and that they were contagious. It is probable that what the speaker intended to convey was that the process was due to infection, rather than to the effects of violence, and I begin to believe that he was not far wrong. It would be interesting to know whether horses used in mines, where they must frequently be subjected to bumps and knocks on head and back, are particularly liable to these maladies, and perhaps one of your readers engaged in mining practice would enlighten us on this point.—Veterinary Record.

THE STORY OF A WORM

Recently, an ordinary worm was taken into a large research laboratory for the purpose of study. The life of this worm heretofore had been thirty days. None of its ancestors had lived longer. All the worms of this family were born, ate green vegetables, got a little longer and much thicker, and after they had gorged themselves, they died. This particular worm was starved, when it was twenty-three days old for one week; then fed for a week and starved for a week; the alternate feeding and starving were kept up for twelve months. In other words, they prolonged the life of this worm twelve times its natural duration, or until it was 365 days old. Many others were experimented on in the same manner with the same results.

Moral: "We dig our graves with our teeth."

—Pageant News Letter, No. 1, Pageant of Progress, Chicago.

NEVER-FAILING MANGE REMEDY

Here in Queensland we see more mange in one month than one would probably see in a whole lifetime at any other place. We find that the following lotion stands alone; one application never failing to clean up the very worst case:

Powdered Cavadella seeds.....	10 parts
Sulphur sublimate	6 parts
Burnt alum	4 parts
Linseed oil 100	parts

Directions: Apply the lotion over one third of the body (if general) at the time, rubbing in well with a brush and wash off with hot soapy water in four days.—Brisbane Vet. Hospital, Brisbane, Australia.

YEAST THERAPY

I have good results from the use of crumbled yeast cakes in many forms of digestive troubles in both horses and cattle. I procure the crumbled waste from yeast cake makers at the small cost of 10 cents a pound, fresh every day. I also use it to good advantage as a base for several tonic powders.

A discussion of yeast and its uses in the treatment of animals seems important as it is both a very useful and a cheap medicinal agent.—W. E. T., Ont.

2,000,000 MARK PASSED IN NUMBER OF CATTLE TESTED

The total number of cattle now under supervision in the tuberculosis-eradication work being carried on by the United States Department of Agriculture in co-operation with the States has passed the 2,000,000 mark, the total for February being 2,027,000. During that month 200,334 cattle were tested, bringing the total of cattle once tested up to 1,181,516, and the total of those in fully accredited herds to 292,716. There are now 361,826 cattle on the waiting list. On March 1, more than 12,000 farmers and breeders had accredited herds.—Clip Sheet, No. 196, U. S. Department of Agriculture.

Hanford's Balsam of Myrrh

C. H. M., Wisconsin, in VETERINARY MEDICINE, January, 1921, inquired about balsam of myrrh. Presuming he referred to Hanford's, I am sending you the formula. Although late, I trust it will be no less welcome. Here is the formula: Tincture of myrrh, and chloroform of each one ounce and wood alcohol eight ounces. This contains 80 per cent of wood alcohol as stated on the label.—W. E. T., Ont.

COLLYRIUM FOR DOGS

For inflammatory conditions of the eye, instead of yellow oxide of mercury ointment, I find 25% argyrol solution much better. Irrigate copiously several times a day and if there is any corneal opacity alternate with a solution of silver nitrate, 10 grains to the ounce, and then wash out the eye with a warm solution of sodium chlorid.

With quinine and urea hydrochlorid and argyrol solution I have cleared up the worst ulcers in 16 days.—D. Richards-Buckley, M. R. C. V. S.

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FOR SALE—Anti-Fis-Tract is a proven remedy for all fistulous tracts, actinomycosis, chronic abscesses, etc. Full directions. $1.00 per dozen. Charges prepaid. I. G. Wimsett, D.V.M., Winfield, Kans.

I HAVE A FEW PAIR OF REGISTERED SILver black foxes for sale. This is the center of the black fox industry of the United States. Dr. F. U. Steele, Muskegon, Mich.

POSITIONS, LOCATIONS, ETC.

POSITION WANTED—With a hog serum plant by experienced pathologist and bacteriologist. Will furnish microscopic equipment. Well qualified and experienced. Address No. 683, care of VETERINARY MEDICINE, 4753 Grand Blvd., Chicago.

WANTED—To buy established veterinary hospital preferably in the northeast states or in the eastern states or an established veterinary practice. Will pay cash. Address No. 674, care of VETERINARY MEDICINE.

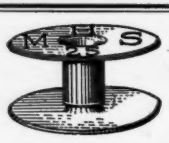
VETERINARY PRACTICES, POSITIONS, ETC., furnished and handled for sale in 48 states. Physicians, dentists and nurses furnished and located. Drug stores for sale and drug positions in all states. F. V. Kniest, Peters Trust Bldg., Omaha, Neb. (Guaranteed Service.) Established 1904.

WANTED—Hospital Assistant. Must be single and understand canine practice. Would consider a non-graduate. Must be American and like to work. Send photo and salary expected. Location, Texas. Address No. 680, care of VETERINARY MEDICINE, 4753 Grand Blvd., Chicago, Ill.

WANTED—Veterinary practice in California—will pay cash for practice with or without equipment in a mixed farming or dairy country or would buy half interest with reliable man. Address No. 681, care of VETERINARY MEDICINE, 4753 Grand Blvd., Chicago, Ill.

POSITION WANTED — (Or practice, if in Ohio) Can consider position any state. Graduate Ohio Univ., Dept. Veterinary Science. Several years' experience, general and technical. Address 3016, care F. V. Kniest, Peters Trust Bldg., Omaha, Nebr.

BACTERIOLOGIST WANTED—To take charge of a small commercial laboratory, producing bacterins, tuberculin and mallein. Address No. 682, care of VETERINARY MEDICINE, 4753 Grand Boulevard, Chicago, Ill.



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TWO COWS POISONED WITH MOLDY FORAGE

Having had cases of blind staggers in horses but never before in cows I was much interested in Dr. Henry Frederick's case reports in your March issue.

A few days after reading the article I saw a cow that seemed to be so affected. She was a small Jersey found leaning heavily against a fence. Taking hold of her head she kept backing until tied up.

Although apparently well in the morning she refused to stand to be milked in the evening. The nose was moist, froth was drooling from the commissures of the mouth and she sucked the tongue like a calf after drinking milk. She was thought to be mad. I, having never seen a cow act that way, was uncertain on this point myself. The pulse was accelerated, but the respirations and temperature were normal.

I administered eserin, atropin and a dose of Fer-Sul cow drench, and left another dose for the morning. Except for the difficulty of keeping the head up she was easy to drench.

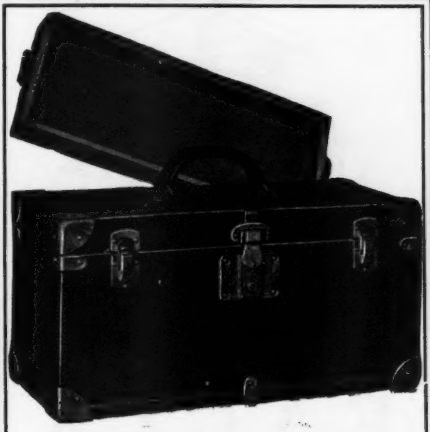
Three days later I met another case, a Red Poll cow, that had been off feed and milk for two days and was acting as if drunk. She was lying down and upon staggering to her feet, flopped down again. The pulse, temperature and respirations were normal. She received eserin and atropin and a drench. The drench was, however, difficult to administer. She recovered in two days. The bowels were normal and the urine clear in both cases.

Cushing, Okla. H. C. Groff, V. M. D.

CARBON TETRACHLORID GAINING WORLD-WIDE ATTENTION

The findings of Dr. Maurice C. Hall, editor of the department of parisitology, in regard to the curative effects of carbon tetrachloride for hookworm, and other blood-sucking worms of animals, is attracting world-wide attention. A recent issue of the London Medical Journal reports its use in the Fiji Islands against hookworm, stating that 98% of the parasites are removed with a single dose of this remarkable agent and comments favorably upon its harmless effect on the patients. The remedy is also attracting attention in Brazil, Indian, Ceylon, and Dutch Guiana.

Dr. I. E. Woodward has been appointed meat inspector for the board of health of Natchitoches, Louisiana.



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PITTSBURGH WIDOW'S ENDOWMENT CAUSES DISCORD

When the widow of the late Dr. H. E. Werntz of Pittsburgh converted the lamented doctor's old establishment into a memorial hospital, where homeless dogs and cats might take refuge from the tyranny of the elements, she unintentionally precipitated a bitter quarrel among the practitioners of that city who claim she has failed to provide for a qualified veterinary attendant to administer medical attention to ailing inmates in accordance with public announcements.

The climax of the arguments was reached at the January meeting of the local association when two erstwhile peaceful practitioners doffed their monocles and cloaks for a pitched battle after an interchange of sizzling idioms, too hot for publication. A timely truce declared to give one of the combatants the opportunity to show that he is actually the veterinary advisor of the new establishment, saved the dignity of the convention.

DEPARTMENT EDITOR HOLDS HIGH POSITION

Professor L. H. Pammel, editor of the department of live stock poisoning of VETERINARY MEDICINE is one of the seven men of national repute in forestry circles who met at Chicago in April to formulate plans for organized tree planting on a large scale. The members of the commission were: Governor J. A. O. Preus of Minnesota; Professor L. H. Pammel of the Iowa State College of Agriculture; Professor James Toumey of Yale University; Mr. W. L. Hall, former Assistant Federal Forester; Mr. William A. Gutherie of Indiana; Mr. Wyllys Baird and Mr. John V. Norcross, both of Chicago.

SUNFLOWERS FOR SILAGE

From the Ohio Experiment Station, at Wooster, comes the information that sunflowers cannot compete with corn for silage in Ohio. From the standpoint of comparative nutrient values corn stands ahead, and is much more palatable. Where the climate is unfavorable for corn, sunflowers may be substituted to good advantage, but in the Mississippi Valley, where corn is such a staple farm product there is no reason at this time to substitute it with sunflowers as an ensilage forage. Sunflowers also have the disadvantage of being very difficult to harvest as compared with corn.

JUDGE RULES HOG VACCINATION IS VETERINARY PRACTICE

In the case of State of Indiana versus W. H. Myers, in which the defendant was charged with violation of the veterinary practice laws of that state for having administered hog cholera serum at a stated sum of ten cents per head the judge found for the state and fined the defendant $25 and costs. The contention of the defense was that vaccination of hogs is a preventive measure and does not come under the laws against the treatment of animals by non-licensed persons; and also that a farmer who in that state is permitted to do his own vaccination has a perfect right to employ whatever assistance he sees fit and to compensate him for the labor.

The judge after pondering over the wealth of technical evidence given by a number of veterinarians, among whom were State Veterinarian Julian, assessed this penalty after overruling a motion to squash the affidavit.

THE HORSE CENSUS

The total number of horses in the United States in a recent government report is given as 21,848,066. Iowa leads with 1,385,522, with Illinois a close second, Kansas third, then Texas, Nebraska, Minnesota, and Missouri, in the order named.

While a number of horses in the country are sufficient, there is a serious shortage of the right kind.

OPEN VETERINARY VOCATION SCHOOL

Prescott.—A class in veterinary surgery started in Prescott with Dr. J. W. Osborn at its head and Wayne S. O'Neal of Phoenix, vocational student, as its first pupil. "The school is not restricted to vocational students," said Dr. Osborn, "but is ready to accommodate pupils from any place."—Tucson (Ariz.) Citizen.

Foot and Mouth Disease Again Serious in England

One of the most serious outbreaks of foot and mouth disease broken out in North England. It is reported to be one of the most widespread visitations experienced for many years. Six counties are said to be effected and twelve counties have been quarantined against movements of cattle.

"Jack and Jill went up the hill,
Like dutiful son and daughter;
Now Jack has typhoid, Jill is ill—
They didn't boil the water."

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ASSOCIATION MEETINGS

A BUMPER VETERINARY PICNIC

As the Illinois State Veterinary Medical Association has decided to forego the pleasures of its annual big mid-summer meeting down state in the interests of the A. V. M. A. meeting at St. Louis, the Central Illinois association invites all the members of the state association to attend its historic annual picnic which, this year, will be held at Miller's Grove, Bloomington, in July. Secretary Sisk of the Central and Secretary Merillat of the State association are planning to make this a memorable occasion—a titanic notandum. Look out for dates in the July issue.

A. V. M. A. CLINIC PROGRAM

First day (forenoon): Genital Organs, Boyd; T. B. Reactors, D. F. Luckey; Sterility, J. F. DeVine. Afternoon: Poultry, Kaupp; Sheep, Newsom; Parasites of Sheep and Hogs, Hall. **Second day** (forenoon): Surgery of Udder, Ferguson; Cholera, Schwarze. Afternoon: T. B. Lesions, B. A. I.; Horses, Merillat.

Dr. H. E. Kingman, Professor of Surgery of the Colorado Veterinary College, has been selected as Director of Clinics for the St. Louis meeting of the A. V. M. A. A complete program for the two day clinic will be published in an early issue.

The annual meeting of the South Carolina Association of Veterinarians was held at the Jefferson Hotel, in Columbia, April 8. The following officers were elected: W. K. Lewis, president; T. J. Kinard, vice-president; M. R. Blackstock, secretary-treasurer. The secretary's address is Spartansburg.

The Thumb Veterinary Medical Association, of Michigan, will hold its next meeting at Bay Port, Michigan, July 20, 1922. Milton J. Geiger, Sec'y.

The Nebraska State Board of Examiners of Veterinary Medicine will hold their next regular examination in Lincoln, June 15.

The Wisconsin State Board of Examiners announce an examination at the Capitol Building, Madison, June 6 and 7, beginning at eight o'clock in the morning.

ASSOCIATION MEETINGS—Continued

The Illinois State Veterinary Medical Association will hold its mid-summer meeting at East St. Louis, in connection with the clinical program of the American Veterinary Medical Association, in lieu of the usual down state meeting.

The Interstate Veterinary Association held a two-day meeting at Wichita, Kansas, in March. The officers are: Dr. F. Fisher, Ralston, Okla., president; Dr. M. W. Goode, Hinton, Okla., vice president; and Dr. L. G. Atkinson, St. Paul, Kans., secretary-treasurer.

The North Dakota Veterinary Medical Association will convene for its summer session at Fargo, July 18-19, 1922.

R. S. Amadon, Secretary.

THE MINNESOTA SUMMER MEETING

The Minnesota State Veterinary Medical Association will hold its summer meeting at the University Farm, in conjunction with a short course to be given by the University of Minnesota. The dates are July 12-13-14. Among the speakers from outside of the state are Professor O. V. Brumley, of the Ohio State University; Professor J. M. Frost, of the New York State Veterinary College, Cornell University; Professor L. Van Es, of the University of Nebraska; L. A. Merillat, Editor of Veterinary Medicine, Chicago; H. Lothe, of Waukesha, Wisconsin; and Professor H. S. Murphy, of the Iowa State College of Agriculture.

Evening programs of an entertaining and educational nature are being provided, and an interesting and instructing meeting is anticipated.—C. P. Fitch, Secretary-Treasurer.

CENTRAL NEBRASKA VETERINARY ASSOCIATION

The spring meeting of the Central Nebraska Veterinary Medical Association was convened at Cozad, March 29. The features of the meeting were surgical clinics by J. S. Anderson, of Aurora, and autopsies of tubercular reactors by Dr. Woodring, assistant state veterinarian. The latter was witnessed by a number of stock men whom the doctor convinced as to the accuracy of the test. The literary program consisted of a paper on "Colics" by C. J. Sall,

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ASSOCIATION MEETINGS—Continued

on "Canine Distemper," by P. T. Smith, and an address by Dr. A. T. Kinsley, on "Swine Feedings, Breeding, and Sanitation." Dr. H. S. Jensen held a round table on "Cattle Practice" which brought out many points in the use of new drugs. Dr. Jensen acted as toastmaster at the banquet. Addresses were made by Henry Holt, A. A. Munn, and Leo Stuhr, secretary of the State Department of Agriculture.

The following officers were elected: Dr. L. J. Boulier, Cozad, president; Dr. E. C. Jones, Grand Island, vice-president; Dr. J. N. Gruber, Lexington, secretary-treasurer. The next meeting will be held at Kierney next September.

L. B. Wolcott, Secretary.

KENTUCKY VETERINARY MEDICAL ASSOCIATION

The annual meeting of the Kentucky Veterinary Medical Association was held at Owensboro, February 8-9, 1922. The convention was one of the most successful ever held by that association. The program was featured by a discussion of The Intradermal Tuberculin Test, in which all of the important phases of this test were fully discussed. The midsummer meeting will be held at Lexington, July 12-13, 1922.

The following officers were elected: Dr. J. K. Ditto, Pleasureville, president; Dr. Wm. M. Coffee, LaCenter, 1st vice president; Dr. J. A. Austin, Fulton, 2nd vice-president; Dr. E. C. Higdon, Madisonville, 3rd vice president; and Dr. J. A. Winkler, Newport, secretary-treasurer.

J. A. Winkler, Secretary-Treasurer.

MICHIGAN STATE SUMMER MEETING

The annual summer meeting of the Michigan State Veterinary Medical Association will be held at East Lansing, June 28-30, in conjunction with the state department of agriculture, the local branch of the United States bureau of animal industry, and the veterinary department of the agricultural college. The president has named committees to take active charge of the arrangements. The chairmen of these committees are:

Committee to represent the association, W. N. Armstrong, Concord; committee to represent the state department of agriculture, J. B.

ASSOCIATION MEETINGS—Continued

Killham, Lansing; committee to represent the bureau of animal industry, H. M. Newton, Lansing; committee to represent the veterinary department, W. F. Chamberlain, East Lansing; clinic committee, J. P. Hutton, Lansing; entertainment committee, O. A. Taylor, East Lansing; ladies' committee, Mrs. J. P. Hutton, Lansing.

The first day will be "clinic day"; the second, "practitioners' day," and the third, "scientific day."

The entertainment and ladies' committees are charged with the fun and frolic of the occasion, and all interests are combining for the good of the cause.

The secretary is circulating a questionnaire among the members, seeking information about the ground the program should cover, in regard to every species of domestic animals, together with suggestions that well help make the meeting a howling success.

The officers of this association are: John E. Wurm, Pigeon, president; and Russell A. Runnells, East Lansing, secretary.

The annual meeting of the New York State Veterinary Medical Association will be held at Syracuse, July 26-28, 1922. Dr. C. E. Hayden is the secretary and Professor D. H. Udall is the president.

The Colorado Veterinary Medical Association will hold its semi-annual meeting at Fort Collins, Colorado, on June 1, 2, and 3, 1922. Dr. I. E. Newson, of Fort Collins, is secretary, and Dr. J. F. Meinzer, of La Jara, is president.

The Non-Graduate Veterinary Medical Association of Kentucky held its annual meeting at Dawson Springs, April 4-5. Papers were read on the following subjects: first, Animal Diseases and Important Matters Relative to the Profession; second, Retained After-Births of the Cow; third, An Illustration of the Use of Capsules in Retained Placenta. C. A. Washburn was re-elected president, and Burie E. Parker, secretary. The next meeting of the association will be held at Central City.

The board of veterinary examiners of Texas are: P. P. Starr, Gainesville, president; W. G. Brock, Dallas, vice president; and F. E. Barnes, Waxahachie, secretary-treasurer.

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A Specific Canine Remedy for

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Always

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KANSAS CITY KANSAS

Dr. F. L. Ober of Duluth, Minn., has been appointed assistant county adviser of Saint Louis County. Dr. Ober is active with bull and testing associations and takes a keen interest in poultry scourges.

Dr. F. C. Roach has opened an office for general practice at Nashua, Iowa.

Dr. A. C. Spannaus of Waconia, Minn., has built a veterinary hospital that is reported to be one of the most up-to-date establishments in that state. The hospital has seven stalls, operating room equipped with table and stocks, a pharmacy, office, garage, a central heating plant, hot and cold water, and storage for feed on the second floor.

Dr. A. C. Dononhew has been appointed state veterinarian of Cooper County, Missouri.

Dr. W. H. Lytle, Oregon state veterinarian, is making another effort to have the California authorities annul a ruling made last fall prohibiting the importation of Oregon sheep into California unless they had been dipped by inspectors.

At the federal examination for accredited herd work held in Iowa in 1921, 456 passed successfully.

Dr. W. R. Swan of Stevens Point was elected secretary-treasurer of the Central Wisconsin Association of Veterinary Graduates at the fifth annual meeting of that association at Marshfield in March.

Dr. R. R. Downing of Farma, Illinois, has moved to Mattoon, Illinois, to continue practice, instead of taking the opportunity offered him to enter the governmental service.

The importance of washing milk cans as soon as they are empty is emphasized in instructions to handlers of milk, by the U. S. Department of Agriculture. The carelessness in this connection by hotels, restaurants, bakeries, and other places, is given as a flagrant violation of good milk sanitation.

Drs. W. T. Johnson and Edward Pugh have opened an establishment known as the City Veterinary Hospital at 4208 Washington avenue, Houston, Texas. The hospital has a well stocked pharmacy and is equipped for all animals. Dr. Johnson specializes on the treatment of dogs.

From the Who's Who column of the Beatrice (Neb.) Express we gleam, "Dr. E. J. Neuberger is a graduate of the McKillip Veterinary College of Chicago, a vigorous, fair and square, 100 per cent man and an A-1 veterinarian. He is counted among our useful and progressive citizens in excellent standing with all."

Dr. G. E. Norman of Jasper, Indiana, was elected president of the First District Veterinary Medical Association, at the meeting held in Evansville, during March. Dr. A. P. McDonald of Mt. Vernon is the secretary-treasurer; Dr. Wm. Hume, of Boonville, 1st vice-president; Dr. J. O. Chaille, Ft. Branch, 2nd vice-president; and Dr. R. R. Schultz, 3rd vice-president.

Dr. Lee Marney of Oklahoma City has opened an office for practice at Hinchley, Oklahoma.

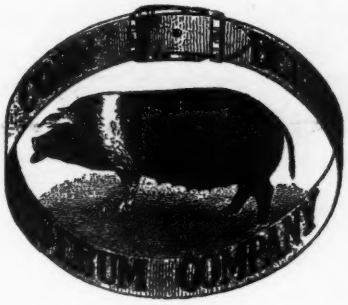
The best known stimulant for the rumen is tobacco. Give a ten cent plug or two every day in the form of boluses. For the atony associated with convalescence from serious diseases, parturition or overfeeding, tobacco stands first.—C. H. Schultz.

Dr. Walter Runge, city veterinarian of Newark, N. J., announces that plans are out for the building of stables for horses to be used in producing municipal antitoxin.

Dr. A. M. Storm of Ortonville, Minn., has purchased the veterinary hospital of Dr. E. N. Scheon of that city. Dr. Storm, who is a graduate of the Indiana Veterinary College, takes over the extensive practice built up by his predecessor with a determination to make it still bigger.

Dr. P. McKenzie of Fergus, N. D., has taken over the practice of Dr. E. G. Sloulin of Aneta who moves to the western part of the state. Dr. McKenzie is a graduate of the veterinary department of the Ohio State University.

THE



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Dr. Raymond Miller has moved from Van Wert, Ohio, to Marion, retaining his practice in the former place with the aid of an assistant.

The veterinarian is the watch dog of our ports; he prevents the introduction of foreign plagues into the country; he inspects live stock for interstate shipment and thus lessens the dangers of internal plagues; he investigates new diseases, formulates new ideas about the old ones, and enforces new methods of prevention, cure, and eradication.

Dr. Fred Middleton of Conrad, Iowa, has moved to Gladbrook where he has opened an office for business. Dr. Middleton is an alumnus of the Chicago Veterinary College.

Dr. H. M. Barrows, the capable assistant of Dr. E. L. Quitman of Chicago for several years has opened an office for practice at Plano, Illinois.

Dr. H. H. Groat, who is a son of Editor Groat of the Chase (Kans.) Register, has recently moved to Lyons, Kansas, where he has taken over the practice of Dr. B. O. Moore.

Dr. E. H. Hyland, Nebr., has moved from Albion, Nebr., to his former home, Fremont, Nebr., where he is associated in practice with Dr. Boyle, who succeeded him several years ago.

WE CLIP A COMPLIMENT

Particularly good were Blackman's talks on improving scrub herds by pure-bred sires and by feeding scientific balanced rations. Rudnick, Iowa state college man, gave a lot of practical dope about improving butter and milk quality and making markets, and Dr. J. F. DeVine of Goshen, N. Y., gave the best talk on "Contagious Abortion" that has ever been given in the state—or anywhere else, I guess.

Imagine me—sitting for over an hour under a rapid-fire discussion of a strictly technical, pathological, obstetrical subject and taking a vital interest in every phase of it. Imagine any layman doing it.

The fact is, of course, that DeVine is probably the biggest man in his line in this part of the country, if not anywhere, and his lectures are so crammed full of facts—some of them brand-new discoveries in research—and the man himself is so happily gifted with making

you en rapport with his subject that his lectures are positively fascinating.

I question whether Vermont dairymen could have learned so much about a very important phase of their business by paying out hundreds of dollars otherwise as those present learned from DeVine.

—Rutland Daily Herald.

Mayfield, Ky., April 24.—(Special)—Dr. C. A. Washburn, veterinarian, and daughter, Mildred, narrowly escaped death Sunday night when their automobile was struck by an Illinois Central passenger train at Broadway crossing. Dr. Washburn saw the train in time to swerve his car. The engine caught the right rear wheel, demolishing the car. Dr. Washburn and his daughter escaped uninjured.

Under the title of "General Lymphangitis," Dr. J. P. Klench, December 13, 1888, presented a paper before the California State Veterinary Medical Association, describing a disease among horses and mules that closely resembled glanders but which presented clinical differences that excluded that disease. A careful review of the report seems to show that he was dealing with the epizootic lymphangitis that caused so much trouble and sometimes confusion during the late war.

Dr. and Mrs. Richard Wharton of Lost Springs, Kansas, are rejoicing because of the arrival, on April 6th, of a son, "Richard Lincoln Wharton."

Dr. C. R. Donham of Mexico, Mo., has accepted a position on the teaching staff of the Oregon Agricultural College.

Dr. F. A. Hines of the firm of Hines and Madden, of Gravity, Ia., was elected Mayor of that city at a recent election.

Dr. H. B. Allen, a deputy state veterinarian for the state of Missouri, is now located at Oregon, Mo., where he is in general practice.

Dr. W. H. Richards, one of the first graduate veterinarians that located in Kansas, died in March at Emporia, Kans. The Doctor located at Emporia over thirty years ago. He was a splendid practitioner and a leader in the profession.

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Every professional man knows these products are excellent, reliable and inexpensive as antifermentative, antiperiodic, antispasmodic, antiseptic.

Employed in surgical and sanitary work. Does not have the nauseating odor of many products. Used as wash, spray, douche, and inhalant.

Prices

Pints, at	$ 0.70
One gallon	4.00
Two gallons	6.50
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Range of Use: Pneumonia, Influenza, Distemper, Strangles, Infectious Diahorrea and Enteritis.

10% Solutions in Doses of One Ounce, Three Times a Day

Guaialyptol-Veterinary

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This compound fairly tried will surely repeat your call. It is the best on the market for its purposes.

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Gallon	6.00

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Correspondence solicited from qualified veterinarians.

Lathrop Serum Co.
Lathrop, Mo.

MRS. SCHWARZKOPF DIES FOLLOWING LONG ILLNESS

Mrs. Laleopoldina Schwarzkopf, wife of Major Olaf Schwarzkopf, U. S. Army, retired, died at Hotel Stolzenfels, Capellen, Germany, April 7, 1922.

Mrs. Schwarzkopf had been in declining health for a number of years. Major and Mrs. Schwarzkopf came to Germany last November and have been living at Capellen.

Mrs. Schwarzkopf will be remembered for her charming personality, in the army and among veterinarians and friends. She was born in Budapest, Hungary, sixty-five years ago and had lived in the United States since 1884.

Most of Major Schwarzkopf's service as veterinarian in the army was with the 3rd U. S. cavalry.

Funeral services were held at Capellen, and burial took place at the cemetery there.

Mrs. Lydia Beachley, age 56, and her son, Kenneth Beachley, age 32, wife and son of Dr. Rufus M. Beachley, of Meyersdale, Pennsylvania, were both instantly killed when they were struck by a B. & O. freight train on April 6, 1922, at that place.

Dr. H. L. Mahnken, of Windsor, Mo., was married March 8, 1922. Mrs. Mahnken was Ethel Barnard, a graduate in Domestic Science of the Colorado Agricultural College.

Dr. J. B. Snyder, formerly in practice in Miami County, Indiana, recently purchased a small farm near Blue Springs, Mo., where he will direct farm operations and a general practice.

Dr. W. H. Buchleiter, formerly of Braddyville, Ia., succeeded Dr. R. T. Irvin in general practice at Coin, Ia. Dr. Irvin is now located at Hamburg, Ia.

Dr. C. E. Simpson, of Yates Center, Kansas, purchased a carload of Hereford cows in the Kansas City Stock Yards on April 12th for one of his clients.

Hydrocephalous Monstrosity

An exceptionally large hydrocephalous monstrosity was delivered from a cow during March, 1922, by Dr. Kenneth G. McKay, of Colville, Wash. The calf's head measured 33 inches from the forehead over its apex to the cranium

posteriorly. The right eye was normal and the left eye absent.

The delivery was effected by tapping and crushing the enlargement.

Dr. C. C. Walker, a field inspector of the B. A. I., formerly of Helena, Montana, has been transferred to Bath, New York, for County Farm Bureau work.

Speaking before the veterinarians of Illinois at the Illinois Veterinary Conference in 1920 on the matter of hog cholera immunization, Dr. C. H. Hays said: "The kind of service we render enters into the situation, because upon careful observation it is evident that there has been considerable reflection upon our profession due to the inefficient service that has been given in many instances."

Dr. W. A. Litton has moved from Lake Charles, Louisiana, to Port Arthur, Texas, where he was received by the mayor and other citizens who welcomed the arrival of a veterinarian to that district.

Dr. Charles Carr, of Clinton, Minnesota, has moved into a new establishment which serves the combined purpose of a hospital and feed stable.

Dr. E. C. Higdon, Madisonville, Ky., joined the appendicitis club in March and came out of the initiation ceremonies unscathed with the exception of the official brand that distinguishes members of this club from ordinary mortals.

"The work of biologists and chemists has revealed the fact that no other food is so vital to the welfare and health of the human race as milk."—North, A Half Century of Public Health.

COUNTY AGENTS HAVE RANK OF ASSISTANT PROFESSORS

Under the California plan of organization of extension work in co-operation with the United States Department of Agriculture, county agents have the rank of assistant professors in the university and are entitled to all the rights and privileges of the resident teaching force.

The 51-year old horse "Clover" belonging to Pastor Uriah Myers of Catawissa, New York,

Paralysis In Swine

Animals in as Serious a Condition as Shown Here Have Responded Quickly to VITAMINERAL Treatment

Many of the biggest breeders of pure bred swine in the country are now feeding VITAMINERAL every day with their regular ration.

Results are marvelous. VITAMINERAL is a perfect mixture of the bone building minerals and the life giving Vitamines without which animal or human life cannot exist.

Many Veterinarians are prescribing it in ton lots. The breeder is buying minerals from some one. Why not you?

VITAMINERAL sold only to the Veterinarian Profession. Look around your territory and notice the field which you have.

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50 gal. drums, inc., $1.48 gal.
30 gal. drums, inc., $1.58 gal.
10 gal. cans, inc., $1.80 gal.

Tincture of Iodine, U. S. P.

4—1 gal. bottles, inc., $5.87 gal.
1 gal. bottle, $6.12 gal.

Tincture of Iodine (Special)

4—1 gal. bottles, inc., $4.62 gal.
1 gal. bottle, inc., $4.87 gal.

Antiseptic Liquid Soap

(Meets with Approval of Bureau of Animal Industry)

30 gal. drums, inc., $0.85 gal.
10 gal. cans, inc., $1.10 gal.
5 gal. cans, inc., $1.20 gal.

3% for Cash with Order

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401 Delaware Street Kansas City, Mo.

was exhibited as an attraction at the Masonic Exposition at Madison Square Garden during the week of May 8.

EXAMINER FOR VETERINARIANS

State Department of Agriculture, Columbus, announced the appointment of Dr. Norton Dock, of Cincinnati, as member of the State Veterinary Examiners' Board. He succeeds Dr. Reuben Hilty, whose term has expired. Dr. J. A. Lane, negro, of Cincinnati, was named field veterinarian.—Cincinnati Post.

HIGH AUTHORITIES DISAGREE

Our flock of chickens has the roup. We heard that one could vaccinate the birds for the disease. If so, could you give us information as to how it is done, and what is used for it?—A. B., Adrian, Mich.

Vaccination for roup and chicken pox has been done with some success experimentally, but has not been accepted as a generally practical method of controlling these diseases. The Federal Department of Agriculture does not recommend the practice, saying that it has not proved successful. Vaccines may be obtained with directions for their use, however, from the Veterinary Department of the Ohio State University at Columbus, O., and the Veterinary Department of the University of California, Berkeley, Cal.—Rural New Yorker.

(Continued from Page 298)

probably came into it. It was mentioned in the care of dogs and other animals. The management of the hen, the care of her, is just as important in handling the diseases because when you are called, probably malnutrition or improper feeding is the fundamental cause of most of the trouble.

The Word "Ration" Defined

Now one can take any grain mixture provided it is a whole grain and make up a satisfactory grain part of ration, but remember that the definition of a ration is what an animal or anything eats within a certain given length of time, for instance, one day. Now even people ask questions about the value of a certain mash or certain scratch grain for poultry. I am not interested in those two separately because they belong together. A ration is everything they eat. It includes the grain, it includes the mash, it includes the mineral feeds and it includes the water. They can not be separated in considering the ration.

(To Be Continued)